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LECTURES AND ADDRESSES

DELIVERED BEFORE THE
DEPARTMENTS OF

PSYCHOLOGY AND PEDAGOGY

IN CELEBRATION OF THE

TWENTIETH ANNIVERSARY

OF THE OPENING OF

CLARK UNIVERSITY

SEPTEMBER, 1909

Part I

LECTURES BEFORE THE DEPARTMENT OF PSYCHOLOGY

Part II

LECTURES BEFORE THE DEPARTMENT OF PEDAGOGY

THE INSTITUTE OF PSYCHO-ANALYSIS.

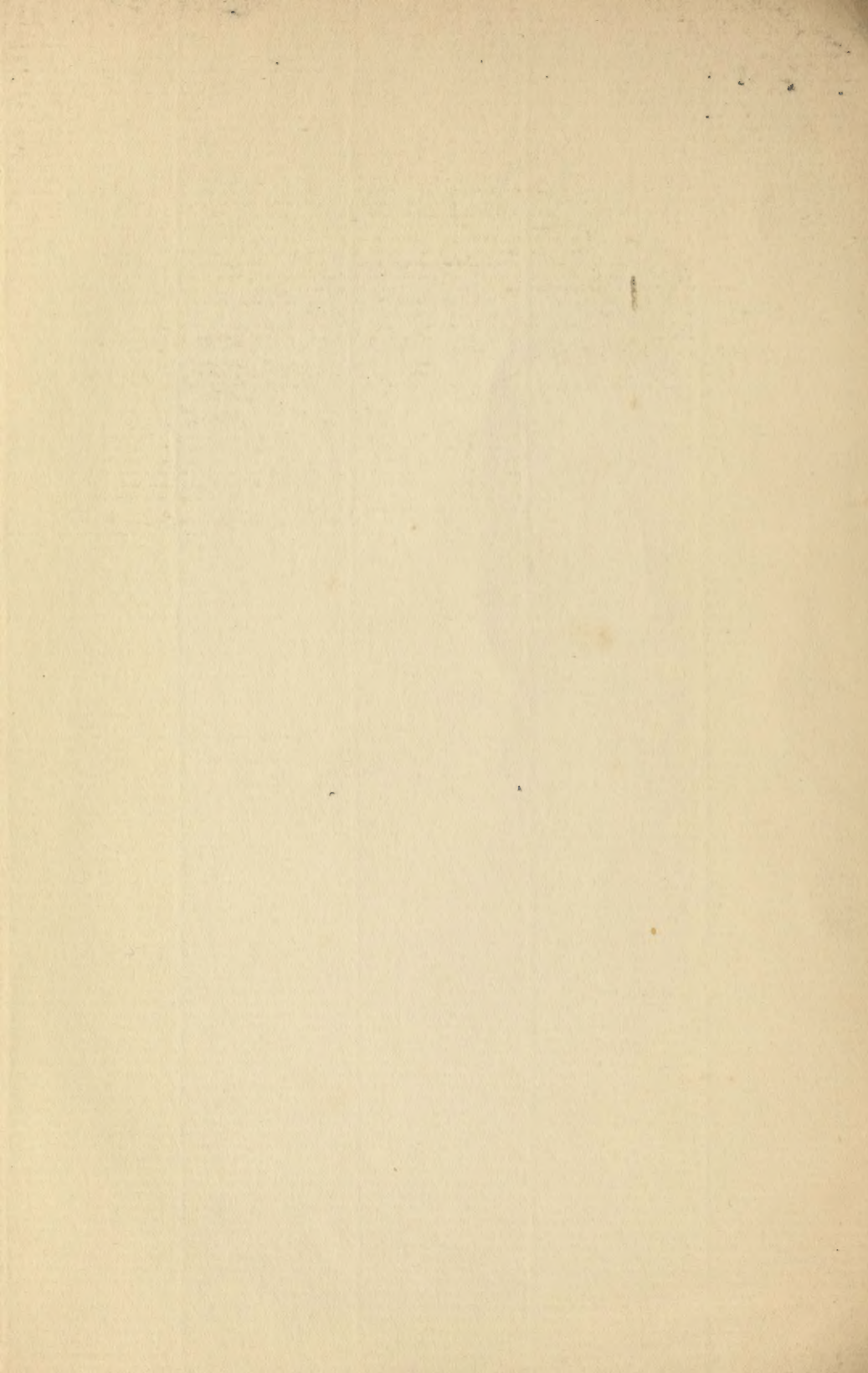
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THE INSTITUTE OF PSYCHO-ANALYSIS



1 Franz Boas
2 E. B. Titchener
3 William James
4 William Stern
5 Leo Burgerstein
6 G. Stanley Hall
7 Sigmund Freud

8 Carl G. Jung
9 Adolf Meyer
10 H. S. Jennings
11 C. E. Seashore
12 Joseph Jastrow
13 J. McK. Cattell
14 E. F. Buchner

15 E. Katzenellenbogen
16 Ernest Jones
17 A. A. Brill
18 Wm. H. Burnham
19 A. F. Chamberlain
20 Albert Schinz
21 J. A. Magni

22 B. T. Baldwin
23 F. Lyman Wells
24 G. M. Forbes
25 E. A. Kirkpatrick
26 Sandor Ferenczi
27 E. C. Sanford
28 J. P. Porter

29 Sakyo Kanda
30 Hikoso Kakise
31 G. E. Dawson
32 S. P. Hayes
33 E. B. Holt
34 C. S. Berry
35 G. M. Whipple

36 Frank Drew
37 J. W. A. Young
38 L. N. Wilson
39 K. J. Karlson
40 H. H. Goddard
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Lectures and addresses delivered in connection with the Celebration have been, or are to be, published as follows:

CHINA AND THE FAR EAST, GEORGE H. BLAKESLEE, Ed.

Thomas Y. Crowell & Co., New York, 1910.

PROCEEDINGS OF THE CHILD CONFERENCE FOR RESEARCH AND WELFARE, HELD AT CLARK UNIVERSITY, JULY, 1909.

Pedagogical Seminary, XVI, 1909, Nos. 3 and 4, pp. 257. Also as a volume, G. E. Stechert & Co., New York, 1909.

LECTURES AND ADDRESSES BEFORE THE DEPARTMENT OF PSYCHOLOGY

American Journal of Psychology, XXI, 1910, Nos. 2 and 3. Also as Part I of this work.

ADDRESSES BEFORE THE DEPARTMENT OF PEDAGOGY

Pedagogical Seminary, XVII, 1910, No. 1. Also as Part II of this work.

LECTURES AND ADDRESSES BEFORE THE DEPARTMENT OF CHEMISTRY

In course of publication in the *Journal of the American Chemical Society*.

LECTURES BEFORE THE DEPARTMENT OF MATHEMATICS AND PHYSICS

(To be published.)

CONFERENCE ON BIOLOGICAL INSTRUCTION

(To be published.)

A STUDY IN EVOLUTION BASED ON COLOR CHARACTERS OF PIGEONS

By PROF. C. O. WHITMAN, of the University of Chicago.

(To be published.)

INTRODUCTION

Clark University marked the close of its tenth year in 1899 by inviting professors in the several departments interested to visit the University and listen to lectures by the following European scholars, who were brought over by the University for this purpose: Santiago Ramón y Cajal, Professor of Neurology at the University of Madrid; Angelo Mosso, Professor of Physiology and Rector of the University of Turin; August Forel, late Professor of Psychiatry at the University of Zürich and Director of the Burghölzli Asylum; Émile Picard, Professor of Mathematics at the University of Paris; and Ludwig Boltzmann, Professor of Theoretical Physics at the University of Vienna.¹

The success of this programme and the many commendations received from eminent men of science the world over upon this new type of academic celebration and festivity, which, instead of formal exercises with gown and procession, devoted itself to the discussion of questions on the frontier of human knowledge pertaining to the advancement of science, prompted us to commemorate our twentieth anniversary in the same way, though on a larger scale. The complete series of meetings was as follows:

July 6th to 10th, Conferences on Child Welfare, at which were given 47 addresses. Here representatives of more than 27 types of child welfare organization were brought together, holding 15 sessions. A national child welfare organization of organizations was completed with the following officers: G. Stanley Hall, President; Ben B. Lindsey, C. E. Stiles, Miss Patty S. Hill, and Hastings H. Hart, Vice-Presidents; Henry S. Curtis, Secretary; Louis N. Wilson, Acting Treasurer.

The second session in the celebration was held September 6-17th. The Department of Mathematics held 8 sessions and offered 7 lectures; The Department of Physics, 11 sessions and 13 lectures; the Department of Chemistry, 8 sessions and 24 lectures; the Department of Biology, 7 sessions and 7 lectures; the Department of History, 20 sessions and 45 lectures²;

¹ See Proceedings, Decennial Celebration, Clark University, 1889-1899. Printed for the University, Worcester, Mass. 1899.

² China and the Far East. George H. Blakeslee, Ed. Thomas Y. Crowell & Co., New York, 1910. pp. 455.

the Department of Education, 10 sessions and 6 lectures;¹ the Department of Psychology, 11 sessions and 14 lectures².

Lectures were given in Psychology and Psychiatry by Prof. Sigmund Freud of the University of Vienna and Dr. Carl G. Jung of the University of Zürich; in Psychology by Prof. William Stern of the University of Breslau, by Prof. E. B. Titchener of Cornell University, Prof. Franz Boas of Columbia University, Prof. H. S. Jennings of Johns Hopkins University, and Dr. Adolf Meyer of the Johns Hopkins Medical School; and in School Hygiene by Prof. Leo Burgerstein of the University of Vienna. The conferences in Psychology were presided over by Prof. Guy Montrose Whipple of Cornell University and Prof. Carl E. Seashore of the University of Iowa; and those in Education by Dr. Elmer Ellsworth Brown, U. S. Commissioner of Education, Prof. F. B. Dresslar of the University of Alabama, and Dr. Thomas A. Storey of the College of the City of New York. Many eminent psychologists and educators from this country contributed to the various sessions of these conferences. The lectures are printed in detail in the present volume.

In other departments lectures were given in Physics by Prof. Vito Volterra of the University of Rome, and Prof. Ernest Rutherford of the University of Manchester; in Chemistry by Prof. André Debièvre of the University of Paris, and by many distinguished scientists from different universities in this country.

At two special public sessions the following honorary degrees were conferred, many of the recipients briefly responding as they received their diplomas:

Degrees conferred Sept. 10, 1910

DOCTORS OF PHYSICS

Vito Volterra, Professor of Mathematical Physics in the University of Rome.

Ernest Rutherford, Professor of Experimental Physics at the University of Manchester.

Albert Abraham Michelson, Professor of Physics in the University of Chicago.

DOCTOR OF LETTERS

Edward Bradford Titchener, Sage Professor of Psychology in Cornell University.

¹*Ped. Sem.*, March, 1910, Vol. 12, No. 1.

²*American Journal of Psychology*, April and July, 1910, Vol. 21, Nos. 2 and 3.

DOCTOR OF MATHEMATICS

Eliakim Hastings Moore, Professor and Head of the Department of Mathematics in the University of Chicago.

DOCTOR OF BIOLOGY

Charles Otis Whitman, Head of the Department of Zoölogy in the University of Chicago.

DOCTORS OF LAWS

Physics

Carl Barus, Professor of Physics in Brown University.

Robert Williams Wood, Professor of Experimental Physics at Johns Hopkins University.

Ernest Fox Nichols, President of Dartmouth College.

Psychology

Franz Boas, Professor of Anthropology in Columbia University. Sigmund Freud, of the University of Vienna.

Herbert Spencer Jennings, Professor of Experimental Zoölogy in Johns Hopkins University.

Adolf Meyer, Director of the Pathological Institute of the New York State Hospital; Professor of Psychiatry in Johns Hopkins Medical School.

William Stern, Extraordinary Professor of Philosophy in the University of Breslau.

Biology

Hermion Carey Bumpus, Director of the American Museum of Natural History and President of the American Association of Museums.

Education and School Hygiene

Leo Burgerstein, of the University of Vienna; Royal Professor in the Oberrealschule.

Carl G. Jung, of the University of Zürich.

Mathematics

Percival Lowell, Non-resident Professor of Astronomy in the Massachusetts Institute of Technology.

William Fogg Osgood, Professor of Mathematics in Harvard University.

Edward Burr Van Vleck, Professor of Mathematics in the University of Wisconsin.

James Pierpont, Professor of Mathematics in Yale University.

Degrees conferred Sept. 16, 1910

DOCTORS OF LAWS

Chemistry

Arthur Michael, Professor of Chemistry, Tufts College.

Arthur A. Noyes, Professor of Chemistry and Director of the Research Laboratory of Physical Chemistry in the Massachusetts Institute of Technology.

William A. Noyes, Head Professor of Chemistry in the University of Illinois.

Marston T. Bogert, Head of the Department of Organic Chemistry in Columbia University.

History

Lebbeus R. Wilfley, First judge of the U. S. Court in China.

DOCTOR OF CHEMISTRY

Theodore W. Richards, Professor of Chemistry in Harvard University.

DOCTORS OF SCIENCE

Chemistry

André Debierne, Director of Research in the University of Paris.

Julius Stieglitz, Professor of Chemistry and Director of the Department of Analytical Chemistry in the University of Chicago.

PART I

LECTURES DELIVERED BEFORE
THE DEPARTMENT OF
PSYCHOLOGY

AS A PART OF THE CELEBRATION OF THE

TWENTIETH ANNIVERSARY OF THE
OPENING OF CLARK UNIVERSITY

SEPTEMBER, 1909

BY

SIGMUND FREUD, C. G. JUNG, WILLIAM STERN
H. S. JENNINGS, FRANZ BOAS, ADOLF
MEYER AND E. B. TITCHENER

Reprinted from

THE AMERICAN JOURNAL OF PSYCHOLOGY
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1910

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DEPARTMENT OF PSYCHOLOGY

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OF THE
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OF THE OPENING OF
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FRANZ BOAS, E. B. TITCHENER AND H. S. JENNINGS.

THE ORIGIN AND DEVELOPMENT OF
PSYCHOANALYSIS¹

By PROF. SIGMUND FREUD (Vienna)

FIRST LECTURE

Ladies and Gentlemen: It is a new and somewhat embarrassing experience for me to appear as lecturer before students of the New World. I assume that I owe this honor to the association of my name with the theme of psychoanalysis, and consequently it is of psychoanalysis that I shall aim to speak. I shall attempt to give you in very brief form an historical survey of the origin and further development of this new method of research and cure.

Granted that it is a merit to have created psychoanalysis, it is not my merit. I was a student, busy with the passing of my last examinations, when another physician of Vienna, Dr. Joseph Breuer,² made the first application of this method to the case of an hysterical girl (1880-82). We must now examine the history of this case and its treatment, which can be found in detail in "Studien über Hysterie," later published by Dr. Breuer and myself.³

But first one word. I have noticed, with considerable satis-

¹Translated from the German by Harry W. Chase, Fellow in Psychology, Clark University, and revised by Prof. Freud.

²Dr. Joseph Breuer, born 1842, corresponding member of the "Kaiserliche Akademie der Wissenschaften," is known by works on respiration and the physiology of the sense of equilibrium.

³"Studien über Hysterie," 1895, Deuticke, Vienna. Second edition, 1909. Parts of my contributions to this book have been translated into English by Dr. A. A. Brill, of New York. ("Selected Papers on Hysteria and other Psychoneuroses, by S. Freud.")

faction, that the majority of my hearers do not belong to the medical profession. Now do not fear that a medical education is necessary to follow what I shall have to say. We shall now accompany the doctors a little way, but soon we shall take leave of them and follow Dr. Breuer on a way which is quite his own.

Dr. Breuer's patient was a girl of twenty-one, of a high degree of intelligence. She had developed in the course of her two years' illness a series of physical and mental disturbances which well deserved to be taken seriously. She had a severe paralysis of both right extremities, with anesthesia, and at times the same affection of the members of the left side of the body; disturbance of eye-movements, and much impairment of vision; difficulty in maintaining the position of the head, an intense *Tussis nervosa*, nausea when she attempted to take nourishment, and at one time for several weeks a loss of the power to drink, in spite of tormenting thirst. Her power of speech was also diminished, and this progressed so far that she could neither speak nor understand her mother tongue; and, finally, she was subject to states of "absence," of confusion, delirium, alteration of her whole personality. These states will later claim our attention.

When one hears of such a case, one does not need to be a physician to incline to the opinion that we are concerned here with a serious injury, probably of the brain, for which there is little hope of cure and which will probably lead to the early death of the patient. The doctors will tell us, however, that in one type of cases with just as unfavorable symptoms, another, far more favorable, opinion is justified. When one finds such a series of symptoms in the case of a young girl, whose vital organs (heart, kidneys), are shown by objective tests to be normal, but who has suffered from strong emotional disturbances, and when the symptoms differ in certain finer characteristics from what one might logically expect, in a case like this the doctors are not too much disturbed. They consider that there is present no organic lesion of the brain, but that enigmatical state, known since the time of the Greek physicians as hysteria, which can simulate a whole series of symptoms of various diseases. They consider in such a case that the life of the patient is not in danger and that a restoration to health will probably come about of itself. The differentiation of such an hysteria from a severe organic lesion is not always very easy. But we do not need to know how a differential diagnosis of this kind is made; you may be sure that the case of Breuer's patient was such that no skillful physician could fail to diagnose an hysteria. We may also add a word here from the history of the case. The illness first appeared while the

patient was caring for her father, whom she tenderly loved, during the severe illness which led to his death, a task which she was compelled to abandon because she herself fell ill.

So far it has seemed best to go with the doctors, but we shall soon part company with them. You must not think that the outlook of a patient with regard to medical aid is essentially bettered when the diagnosis points to hysteria rather than to organic disease of the brain. Against the serious brain diseases medical skill is in most cases powerless, but also in the case of hysterical affections the doctor can do nothing. He must leave it to benign nature, when and how his hopeful prognosis will be realized.¹ Accordingly, with the recognition of the disease as hysteria, little is changed in the situation of the patient, but there is a great change in the attitude of the doctor. We can observe that he acts quite differently toward hystericals than toward patients suffering from organic diseases. He will not bring the same interest to the former as to the latter, since their suffering is much less serious and yet seems to set up the claim to be valued just as seriously.

But there is another motive in this action. The physician, who through his studies has learned so much that is hidden from the laity, can realize in his thought the causes and alterations of the brain disorders in patients suffering from apoplexy or dementia, a representation which must be right up to a certain point, for by it he is enabled to understand the nature of each symptom. But before the details of hysterical symptoms, all his knowledge, his anatomical-physiological and pathological education, desert him. He cannot understand hysteria. He is in the same position before it as the layman. And that is not agreeable to any one, who is in the habit of setting such a high valuation upon his knowledge. Hystericals, accordingly, tend to lose his sympathy; he considers them persons who overstep the laws of his science, as the orthodox regard heretics; he ascribes to them all possible evils, blames them for exaggeration and intentional deceit, "simulation," and he punishes them by withdrawing his interest.

Now Dr. Breuer did not deserve this reproach in this case; he gave his patient sympathy and interest, although at first he did not understand how to help her. Probably this was easier for him on account of those superior qualities of the patient's mind and character, to which he bears witness in his account of the case.

His sympathetic observation soon found the means which

¹ I know that this view no longer holds to-day, but in the lecture I take myself and my hearers back to the time before 1880. If things have become different since that time it has been largely due to the work the history of which I am sketching.

made the first help possible. It had been noticed that the patient, in her states of "absence," of psychic alteration, usually mumbled over several words to herself. These seemed to spring from associations with which her thoughts were busy. The doctor, who was able to get these words, put her in a sort of hypnosis and repeated them to her over and over, in order to bring up any associations that they might have. The patient yielded to his suggestion and reproduced for him those psychic creations which controlled her thoughts during her "absences," and which betrayed themselves in these single spoken words. These were fancies, deeply sad, often poetically beautiful, day dreams, we might call them, which commonly took as their starting point the situation of a girl beside the sick-bed of her father. Whenever she had related a number of such fancies, she was, as it were, freed and restored to her normal mental life. This state of health would last for several hours, and then give place on the next day to a new "absence," which was removed in the same way by relating the newly-created fancies. It was impossible not to get the impression that the psychic alteration which was expressed in the "absence" was a consequence of the excitations originating from these intensely emotional fancy-images. The patient herself, who at this time of her illness strangely enough understood and spoke only English, gave this new kind of treatment the name "talking cure," or jokingly designated it as "chimney sweeping."

The doctor soon hit upon the fact that through such cleansing of the soul more could be accomplished than a temporary removal of the constantly recurring mental "clouds." Symptoms of the disease would disappear when in hypnosis the patient could be made to remember the situation and the associative connections under which they first appeared, provided free vent was given to the emotions which they aroused. "There was in the summer a time of intense heat, and the patient had suffered very much from thirst; for, without any apparent reason, she had suddenly become unable to drink. She would take a glass of water in her hand, but as soon as it touched her lips she would push it away as though suffering from hydrophobia. Obviously for these few seconds she was in her absent state. She ate only fruit, melons and the like, in order to relieve this tormenting thirst. When this had been going on about six weeks, she was talking one day in hypnosis about her English governess, whom she disliked, and finally told, with every sign of disgust, how she had come into the room of the governess, and how that lady's little dog, that she abhorred, had drunk out of a glass. Out of respect for the conventions the patient had remained silent. Now,

after she had given energetic expression to her restrained anger, she asked for a drink, drank a large quantity of water without trouble, and woke from hypnosis with the glass at her lips. The symptom thereupon vanished permanently."¹

Permit me to dwell for a moment on this experience. No one had ever cured an hysterical symptom by such means before, or had come so near understanding its cause. This would be a pregnant discovery if the expectation could be confirmed that still other, perhaps the majority of symptoms, originated in this way and could be removed by the same method. Breuer spared no pains to convince himself of this and investigated the pathogenesis of the other more serious symptoms in a more orderly way. Such was indeed the case; almost all the symptoms originated in exactly this way, as remnants, as precipitates, if you like, of affectively-toned experiences, which for that reason we later called "psychic traumata." The nature of the symptoms became clear through their relation to the scene which caused them. They were, to use the technical term, "determined" (*determiniert*) by the scene whose memory traces they embodied, and so could no longer be described as arbitrary or enigmatical functions of the neurosis.

Only one variation from what might be expected must be mentioned. It was not always a single experience which occasioned the symptom, but usually several, perhaps many similar, repeated traumata co-operated in this effect. It was necessary to repeat the whole series of pathogenic memories in chronological sequence, and of course in reverse order, the last first and the first last. It was quite impossible to reach the first and often most essential trauma directly, without first clearing away those coming later.

You will of course want to hear me speak of other examples of the causation of hysterical symptoms beside this of inability to drink on account of the disgust caused by the dog drinking from the glass. I must, however, if I hold to my programme, limit myself to very few examples. Breuer relates, for instance, that his patient's visual disturbances could be traced back to external causes, in the following way. "The patient, with tears in her eyes, was sitting by the sick-bed when her father suddenly asked her what time it was. She could not see distinctly, strained her eyes to see, brought the watch near her eyes so that the dial seemed very large (*macropia* and *strabismus conv.*), or else she tried hard to suppress her tears, so that the sick man might not see them."²

All the pathogenic impressions sprang from the time when

¹"Studien über Hysterie," 2d edition, p. 26.

²"Studien über Hysterie," 2d edition, p. 31.

she shared in the care of her sick father. "Once she was watching at night in the greatest anxiety for the patient, who was in a high fever, and in suspense, for a surgeon was expected from Vienna, to operate on the patient. Her mother had gone out for a little while, and Anna sat by the sick-bed, her right arm hanging over the back of her chair. She fell into a reverie and saw a black snake emerge, as it were, from the wall and approach the sick man as though to bite him. (It is very probable that several snakes had actually been seen in the meadow behind the house, that she had already been frightened by them, and that these former experiences furnished the material for the hallucination.) She tried to drive off the creature, but was as though paralyzed. Her right arm, which was hanging over the back of the chair, had "gone to sleep," become anesthetic and paretic, and as she was looking at it, the fingers changed into little snakes with deaths-heads. (The nails.) Probably she attempted to drive away the snake with her paralyzed right hand, and so the anesthesia and paralysis of this member formed associations with the snake hallucination. When this had vanished, she tried in her anguish to speak, but could not. She could not express herself in any language, until finally she thought of the words of an English nursery song, and thereafter she could think and speak only in this language."¹ When the memory of this scene was revived in hypnosis the paralysis of the right arm, which had existed since the beginning of the illness, was cured and the treatment ended.

When, a number of years later, I began to use Breuer's researches and treatment on my own patients, my experiences completely coincided with his. In the case of a woman of about forty, there was a tic, a peculiar smacking noise which manifested itself whenever she was laboring under any excitement, without any obvious cause. It had its origin in two experiences which had this common element, that she attempted to make no noise, but that by a sort of counter-will this noise broke the stillness. On the first occasion, she had finally after much trouble put her sick child to sleep, and she tried to be very quiet so as not to awaken it. On the second occasion, during a ride with both her children in a thunder-storm the horses took fright, and she carefully avoided any noise for fear of frightening them still more.² I give this ex-

¹ "Studien über Hysterie," 2d edition, p. 30.

² *Loc cit.*, 2d ed. pp. 43-46. A selection from this book, augmented by several later treatises on hysteria, lies before me, in an English translation by Dr. A. A. Brill, of New York. It bears the title "Selected Papers on Hysteria and other Psychoneuroses," 1909. [No. 4 of the Nervous and Mental Disease Monograph Series, New York.]

ample instead of many others which are cited in the "Studien über Hysterie."

Ladies and gentlemen, if you will permit me to generalize, as is indispensable in so brief a presentation, we may express our results up to this point in the formula: *Our hysterical patients suffer from reminiscences.* Their symptoms are the remnants and the memory symbols of certain (traumatic) experiences.

A comparison with other memory symbols from other sources will perhaps enable us better to understand this symbolism. The memorials and monuments with which we adorn our great cities, are also such memory symbols. If you walk through London you will find before one of the greatest railway stations of the city a richly decorated Gothic pillar—"Charing Cross." One of the old Plantagenet kings, in the thirteenth century, caused the body of his beloved queen Eleanor to be borne to Westminster, and had Gothic crosses erected at each of the stations where the coffin was set down. Charing Cross is the last of these monuments, which preserve the memory of this sad journey.¹ In another part of the city, you will see a high pillar of more modern construction, which is merely called "the monument." This is in memory of the great fire which broke out in the neighborhood in the year 1666, and destroyed a great part of the city. These monuments are memory symbols like the hysterical symptoms; so far the comparison seems justified. But what would you say to a Londoner who to-day stood sadly before the monument to the funeral of Queen Eleanor, instead of going about his business with the haste engendered by modern industrial conditions, or rejoicing with the young queen of his own heart? Or to another, who before the "Monument" bemoaned the burning of his loved native city, which long since has arisen again so much more splendid than before?

Now hystericals and all neurotics behave like these two unpractical Londoners, not only in that they remember the painful experiences of the distant past, but because they are still strongly affected by them. They cannot escape from the past and neglect present reality in its favor. This fixation of the mental life on the pathogenic traumata is an essential, and practically a most significant characteristic of the neurosis. I will willingly concede the objection which you are probably formulating, as you think over the history of Breuer's patient. All her traumata originated at the time when she was caring for her sick father, and her symptoms could only be regarded as memory symbols of his sickness and death. They corre-

¹ Or rather the later copy of such a monument. The name "Charing" is itself, as Dr. E. Jones tells me, derived from the words "*chère reine*."

sponded to mourning, and a fixation on thoughts of the dead so short a time after death is certainly not pathological, but rather corresponds to normal emotional behavior. I concede this: there is nothing abnormal in the fixation of feeling on the trauma shown by Breuer's patient. But in other cases, like that of the tic that I have mentioned, the occasions for which lay ten and fifteen years back, the characteristic of this abnormal clinging to the past is very clear, and Breuer's patient would probably have developed it, if she had not come under the "cathartic treatment" such a short time after the traumatic experiences and the beginning of the disease.

We have so far only explained the relation of the hysterical symptoms to the life history of the patient; now by considering two further moments which Breuer observed, we may get a hint as to the processes of the beginning of the illness and those of the cure. With regard to the first, it is especially to be noted that Breuer's patient in almost all pathogenic situations had to suppress a strong excitement, instead of giving vent to it by appropriate words and deeds. In the little experience with her governess' dog, she suppressed, through regard for the conventions, all manifestations of her very intense disgust. While she was seated by her father's sick bed, she was careful to betray nothing of her anxiety and her painful depression to the patient. When, later, she reproduced the same scene before the physician, the emotion which she had suppressed on the occurrence of the scene burst out with especial strength, as though it had been pent up all along. The symptom which had been caused by that scene reached its greatest intensity while the doctor was striving to revive the memory of the scene, and vanished after it had been fully laid bare. On the other hand, experience shows that if the patient is reproducing the traumatic scene to the physician, the process has no curative effect if, by some peculiar chance, there is no development of emotion. It is apparently these emotional processes upon which the illness of the patient and the restoration to health are dependent. We feel justified in regarding "emotion" as a quantity which may become increased, derived and displaced. So we are forced to the conclusion that the patient fell ill because the emotion developed in the pathogenic situation was prevented from escaping normally, and that the essence of the sickness lies in the fact that these "imprisoned" (*dingeklemmt*) emotions undergo a series of abnormal changes. In part they are preserved as a lasting charge and as a source of constant disturbance in psychical life; in part they undergo a change into unusual bodily innervations and inhibitions, which present themselves as the physical symptoms of the case. We have coined the name "hysterical

conversion" for the latter process. Part of our mental energy is, under normal conditions, conducted off by way of physical innervation and gives what we call "the expression of emotions." Hysterical conversion exaggerates this part of the course of a mental process which is emotionally colored; it corresponds to a far more intense emotional expression, which finds outlet by new paths. If a stream flows in two channels, an overflow of one will take place as soon as the current in the other meets with an obstacle.

You see that we are in a fair way to arrive at a purely psychological theory of hysteria, in which we assign the first rank to the affective processes. A second observation of Breuer compels us to ascribe to the altered condition of consciousness a great part in determining the characteristics of the disease. His patient showed many sorts of mental states, conditions of "absence," confusion and alteration of character, besides her normal state. In her normal state she was entirely ignorant of the pathogenic scenes and of their connection with her symptoms. She had forgotten those scenes, or at any rate had dissociated them from their pathogenic connection. When the patient was hypnotized, it was possible, after considerable difficulty, to recall those scenes to her memory, and by this means of recall the symptoms were removed. It would have been extremely perplexing to know how to interpret this fact, if hypnotic practice and experiments had not pointed out the way. Through the study of hypnotic phenomena, the conception, strange though it was at first, has become familiar, that in one and the same individual several mental groupings are possible, which may remain relatively independent of each other, "know nothing" of each other, and which may cause a splitting of consciousness along lines which they lay down. Cases of such a sort, known as "double personality" ("double conscience"), occasionally appear spontaneously. If in such a division of personality consciousness remains constantly bound up with one of the two states, this is called the *conscious* mental state, and the other the *unconscious*. In the well-known phenomena of so-called post hypnotic suggestion, in which a command given in hypnosis is later executed in the normal state as though by an imperative suggestion, we have an excellent basis for understanding how the unconscious state can influence the conscious, although the latter is ignorant of the existence of the former. In the same way it is quite possible to explain the facts in hysterical cases. Breuer came to the conclusion that the hysterical symptoms originated in such peculiar mental states, which he called "hypnoidal states." (*hypnoide Zustände*.) Experiences of an emotional nature, which occur dur-

ing such hypnoidal states easily become pathogenic, since such states do not present the conditions for a normal draining off of the emotion of the exciting processes. And as a result there arises a peculiar product of this exciting process, that is, the symptom, and this is projected like a foreign body into the normal state. The latter has, then, no conception of the significance of the hypnoidal pathogenic situation. Where a symptom arises, we also find an amnesia, a memory gap, and the filling of this gap includes the removal of the conditions under which the symptom originated.

I am afraid that this portion of my treatment will not seem very clear, but you must remember that we are dealing here with new and difficult views, which perhaps could not be made much clearer. This all goes to show that our knowledge in this field is not yet very far advanced. Breuer's idea of the hypnoidal states has, moreover, been shown to be superfluous and a hindrance to further investigation, and has been dropped from present conceptions of psychoanalysis. Later I shall at least suggest what other influences and processes have been disclosed besides that of the hypnoidal states, to which Breuer limited the causal moment.

You have probably also felt, and rightly, that Breuer's investigations gave you only a very incomplete theory and insufficient explanation of the phenomena which we have observed. But complete theories do not fall from Heaven, and you would have had still greater reason to be distrustful, had any one offered you at the beginning of his observations a well-rounded theory, without any gaps; such a theory could only be the child of his speculations and not the fruit of an unprejudiced investigation of the facts.

SECOND LECTURE

Ladies and Gentlemen: At about the same time that Breuer was using the "talking-cure" with his patient, M. Charcot began in Paris, with the hystericals of the Salpêtrière, those researches which were to lead to a new understanding of the disease. These results were, however, not yet known in Vienna. But when about ten years later Breuer and I published our preliminary communication on the psychic mechanism of hysterical phenomena, which grew out of the cathartic treatment of Breuer's first patient, we were both of us under the spell of Charcot's investigations. We made the pathogenic experiences of our patients, which acted as psychic traumata, equivalent to those physical traumata whose influence on hysterical paralyses Charcot had determined; and Breuer's hypothesis of hypnoidal states is itself only an echo of the fact

that Charcot had artificially reproduced those traumatic paralysees in hypnosis.

The great French observer, whose student I was during the years 1885-86, had no natural bent for creating psychological theories. His student, P. Janet, was the first to attempt to penetrate more deeply into the psychic processes of hysteria, and we followed his example, when we made the mental splitting and the dissociation of personality the central points of our theory. Janet propounds a theory of hysteria which draws upon the principal theories of heredity and degeneration which are current in France. According to his view hysteria is a form of degenerative alteration of the nervous system, manifesting itself in a congenital "weakness" of the function of psychic synthesis. The hysterical patient is from the start incapable of correlating and unifying the manifold of his mental processes, and so there arises the tendency to mental dissociation. If you will permit me to use a banal but clear illustration, Janet's hysterical reminds one of a weak woman who has been shopping, and is now on her way home, laden with packages and bundles of every description. She cannot manage the whole lot with her two arms and her ten fingers, and soon she drops one. When she stoops to pick this up, another breaks loose, and so it goes on.

Now it does not agree very well with this assumed mental weakness of hystericals, that there can be observed in hysterical cases, besides the phenomena of lessened functioning, examples of a partial increase of functional capacity, as a sort of compensation. At the time when Breuer's patient had forgotten her mother-tongue and all other languages save English, her control of English attained such a level that if a German book was put before her she could give a fluent, perfect translation of its contents at sight. When later I undertook to continue on my own account the investigations begun by Breuer, I soon came to another view of the origin of hysterical dissociation (or splitting of consciousness). It was inevitable that my views should diverge widely and radically, for my point of departure was not, like that of Janet, laboratory researches, but attempts at therapy. Above everything else, it was practical needs that urged me on. The cathartic treatment, as Breuer had made use of it, presupposed that the patient should be put in deep hypnosis, for only in hypnosis was available the knowledge of his pathogenic associations, which were unknown to him in his normal state. Now hypnosis, as a fanciful, and so to speak, mystical, aid, I soon came to dislike; and when I discovered that, in spite of all my efforts, I could not hypnotize by any means all of my patients, I resolved to give up hypnotism and to make the cathartic method independent of it.

Since I could not alter the psychic state of most of my patients at my wish, I directed my efforts to working with them in their normal state. This seems at first sight to be a particularly senseless and aimless undertaking. The problem was this: to find out something from the patient that the doctor did not know and the patient himself did not know. How could one hope to make such a method succeed? The memory of a very noteworthy and instructive proceeding came to my aid, which I had seen in Bernheim's clinic at Nancy. Bernheim showed us that persons put in a condition of hypnotic somnambulism, and subjected to all sorts of experiences, had only apparently lost the memory of those somnambulant experiences, and that their memory of them could be awakened even in the normal state. If he asked them about their experiences during somnambulism, they said at first that they did not remember, but if he persisted, urged, assured them that they did know, then every time the forgotten memory came back.

Accordingly I did this with my patients. When I had reached in my procedure with them a point at which they declared that they knew nothing more, I would assure them that they did know, that they must just tell it out, and I would venture the assertion that the memory which would emerge at the moment that I laid my hand on the patient's forehead would be the right one. In this way I succeeded, without hypnosis, in learning from the patient all that was necessary for a construction of the connection between the forgotten pathogenic scenes and the symptoms which they had left behind. This was a troublesome and in its length an exhausting proceeding, and did not lend itself to a finished technique. But I did not give it up without drawing definite conclusions from the data which I had gained. I had substantiated the fact that the forgotten memories were not lost. They were in the possession of the patient, ready to emerge and form associations with his other mental content, but hindered from becoming conscious, and forced to remain in the unconscious by some sort of a force. The existence of this force could be assumed with certainty, for in attempting to drag up the unconscious memories into the consciousness of the patient, in opposition to this force, one got the sensation of his own personal effort striving to overcome it. One could get an idea of this force, which maintained the pathological situation, from the resistance of the patient.

It is on this idea of *resistance* that I based my theory of the psychic processes of hystericals. It had been found that in order to cure the patient it was necessary that this force should be overcome. Now with the mechanism of the cure as

a starting point, quite a definite theory could be constructed. These same forces, which in the present situation as resistances opposed the emergence of the forgotten ideas into consciousness, must themselves have caused the forgetting, and repressed from consciousness the pathogenic experiences. I called this hypothetical process "repression" (*Verdrängung*), and considered that it was proved by the undeniable existence of resistance.

But now the question arose: what were those forces, and what were the conditions of this repression, in which we were now able to recognize the pathogenic mechanism of hysteria? A comparative study of the pathogenic situations, which the cathartic treatment has made possible, allows us to answer this question. In all those experiences, it had happened that a wish had been aroused, which was in sharp opposition to the other desires of the individual, and was not capable of being reconciled with the ethical, æsthetic and personal pretensions of the patient's personality. There had been a short conflict, and the end of this inner struggle was the repression of the idea which presented itself to consciousness as the bearer of this irreconcilable wish. This was, then, repressed from consciousness and forgotten. The incompatibility of the idea in question with the "ego" of the patient was the motive of the repression, the ethical and other pretensions of the individual were the repressing forces. The presence of the incompatible wish, or the duration of the conflict, had given rise to a high degree of mental pain; this pain was avoided by the repression. This latter process is evidently in such a case a device for the protection of the personality.

I will not multiply examples, but will give you the history of a single one of my cases, in which the conditions and the utility of the repression process stand out clearly enough. Of course for my purpose I must abridge the history of the case and omit many valuable theoretical considerations. It is that of a young girl, who was deeply attached to her father, who had died a short time before, and in whose care she had shared—a situation analogous to that of Breuer's patient. When her older sister married, the girl grew to feel a peculiar sympathy for her new brother-in-law, which easily passed with her for family tenderness. This sister soon fell ill and died, while the patient and her mother were away. The absent ones were hastily recalled, without being told fully of the painful situation. As the girl stood by the bedside of her dead sister, for one short moment there surged up in her mind an idea, which might be framed in these words: "Now he is free and can marry me." We may be sure that this idea, which betrayed to her consciousness her intense love for her brother-

in-law, of which she had not been conscious, was the next moment consigned to repression by her revolted feelings. The girl fell ill with severe hysterical symptoms, and, when I came to treat the case, it appeared that she had entirely forgotten that scene at her sister's bedside and the unnatural, egoistic desire which had arisen in her. She remembered it during the treatment, reproduced the pathogenic moment with every sign of intense emotional excitement, and was cured by this treatment.¹

Perhaps I can make the process of repression and its necessary relation to the resistance of the patient, more concrete by a rough illustration, which I will derive from our present situation.

Suppose that here in this hall and in this audience, whose exemplary stillness and attention I cannot sufficiently commend, there is an individual who is creating a disturbance, and, by his ill-bred laughing, talking, by scraping his feet, distracts my attention from my task. I explain that I cannot go on with my lecture under these conditions, and thereupon several strong men among you get up, and, after a short struggle, eject the disturber of the peace from the hall. He is now "repressed," and I can continue my lecture. But in order that the disturbance may not be repeated, in case the man who has just been thrown out attempts to force his way back into the room, the gentlemen who have executed my suggestion take their chairs to the door and establish themselves there as a "resistance," to keep up the repression. Now, if you transfer both locations to the psyche, calling this "consciousness," and the outside the "unconscious," you have a tolerably good illustration of the process of repression.

We can see now the difference between our theory and that of Janet. We do not derive the psychic fission from a congenital lack of capacity on the part of the mental apparatus to synthesize its experiences, but we explain it dynamically by the conflict of opposing mental forces, we recognize in it the result of an active striving of each mental complex against the other.

New questions at once arise in great number from our theory. The situation of psychic conflict is a very frequent one; an attempt of the ego to defend itself from painful memories can be observed everywhere, and yet the result is not a mental fission. We cannot avoid the assumption that still other conditions are necessary, if the conflict is to result in dissociation. I willingly concede that with the assumption of

¹ This case has been translated by Dr. Brill in "Selected papers on hysteria," etc., p. 31—F 4.

"repression" we stand, not at the end, but at the very beginning of a psychological theory. But we can advance only one step at a time, and the completion of our knowledge must await further and more thorough work.

Now do not attempt to bring the case of Breuer's patient under the point of view of repression. This history cannot be subjected to such an attempt, for it was gained with the help of hypnotic influence. Only when hypnosis is excluded can you see the resistances and repressions and get a correct idea of the pathogenic process. Hypnosis conceals the resistances and so makes a certain part of the mental field freely accessible. By this same process the resistances on the borders of this field are heaped up into a rampart, which makes all beyond inaccessible.

The most valuable things that we have learned from Breuer's observations were his conclusions as to the connection of the symptoms with the pathogenic experiences or psychic traumata, and we must not neglect to evaluate this result properly from the standpoint of the repression-theory. It is not at first evident how we can get from the repression to the creation of the symptoms. Instead of giving a complicated theoretical derivation, I will return at this point to the illustration which I used to typify repression.

Remember that with the ejection of the rowdy and the establishment of the watchers before the door, the affair is not necessarily ended. It may very well happen that the ejected man, now embittered and quite careless of consequences, gives us more to do. He is no longer among us, we are free from his presence, his scornful laugh, his half-audible remarks, but in a certain sense the repression has miscarried, for he makes a terrible uproar outside, and by his outcries and by hammering on the door with his fists interferes with my lecture more than before. Under these circumstances it would be hailed with delight if possibly our honored president, Dr. Stanley Hall, should take upon himself the rôle of peacemaker and mediator. He would speak with the rowdy on the outside, and then turn to us with the recommendation that we let him in again, provided he would guarantee to behave himself better. On Dr. Hall's authority we decide to stop the repression, and now quiet and peace reign again. This is in fact a fairly good presentation of the task devolving upon the physician in the psychoanalytic therapy of neuroses. To say the same thing more directly: we come to the conclusion, from working with hysterical patients and other neurotics, that they have not fully succeeded in repressing the idea to which the incompatible wish is attached. They have, indeed, driven it out of consciousness and out of memory, and apparently saved them-

selves a great amount of psychic pain, *but in the unconscious the suppressed wish still exists*, only waiting for its chance to become active, and finally succeeds in sending into consciousness, instead of the repressed idea, a disguised and unrecognizable surrogate-creation (*Ersatzbildung*), to which the same painful sensations associate themselves that the patient thought he was rid of through his repression. This surrogate of the suppressed idea—the symptom—is secure against further attacks from the defences of the ego, and instead of a short conflict there originates now a permanent suffering. We can observe in the symptom, besides the tokens of its disguise, a remnant of traceable similarity with the originally repressed idea; the way in which the surrogate is built up can be discovered during the psychoanalytic treatment of the patient, and for his cure the symptom must be traced back over the same route to the repressed idea. If this repressed material is once more made part of the conscious mental functions—a process which supposes the overcoming of considerable resistance—the psychic conflict which then arises, the same which the patient wished to avoid, is made capable of a happier termination, under the guidance of the physician, than is offered by repression. There are several possible suitable decisions which can bring conflict and neurosis to a happy end; in particular cases the attempt may be made to combine several of these. Either the personality of the patient may be convinced that he has been wrong in rejecting the pathogenic wish, and he may be made to accept it either wholly or in part; or this wish may itself be directed to a higher goal which is free from objection, by what is called sublimation (*Sublimierung*); or the rejection may be recognized as rightly motivated, and the automatic and therefore insufficient mechanism of repression be reinforced by the higher, more characteristically human mental faculties: one succeeds in mastering his wishes by conscious thought.

Forgive me if I have not been able to present more clearly these main points of the treatment which is to-day known as "psychoanalysis." The difficulties do not lie merely in the newness of the subject.

Regarding the nature of the unacceptable wishes, which succeed in making their influence felt out of the unconscious, in spite of repression; and regarding the question of what subjective and constitutional factors must be present for such a failure of repression and such a surrogate or symptom creation to take place, we will speak in later remarks.

THIRD LECTURE

Ladies and Gentlemen: It is not always easy to tell the

truth, especially when one must be brief, and so to-day I must correct an incorrect statement that I made in my last lecture.

I told you how when I gave up using hypnosis I pressed my patients to tell me what came into their minds that had to do with the problem we were working on, I told them that they would remember what they had apparently forgotten, and that the thought which irrupted into consciousness (*Einfall*) would surely embody the memory for which we were seeking. I claimed that I substantiated the fact that the first idea of my patients brought the right clue and could be shown to be the forgotten continuation of the memory. Now this is not always so; I represented it as being so simple only for purposes of abbreviation. In fact, it would only happen the first times that the right forgotten material would emerge through simple pressure on my part. If the experience was continued, ideas emerged in every case which could not be the right ones, for they were not to the purpose, and the patients themselves rejected them as incorrect. Pressure was of no further service here, and one could only regret again having given up hypnosis. In this state of perplexity I clung to a prejudice which years later was proved by my friend C. G. Jung of the University of Zürich, and his pupils to have a scientific justification. I must confess that it is often of great advantage to have prejudices. I put a high value on the strength of the determination of mental processes, and I could not believe that any idea which occurred to the patient, which originated in a state of concentrated attention, could be quite arbitrary and out of all relation to the forgotten idea that we were seeking. That it was not identical with the latter, could be satisfactorily explained by the hypothetical psychological situation. In the patients whom I treated there were two opposing forces: on the one hand the conscious striving to drag up into consciousness the forgotten experience which was present in the unconscious; and on the other hand the resistance which we have seen, which set itself against the emergence of the suppressed idea or its associates into consciousness. In case this resistance was non-existent or very slight, the forgotten material could become conscious without disguise (*Enstellung*). It was then a natural supposition that the disguise would be the more complete, the greater the resistance to the emergence of the idea. Thoughts which broke into the patient's consciousness instead of the ideas sought for, were accordingly made up just like symptoms; they were new, artificial, ephemeral surrogates for the repressed ideas, and differed from these just in proportion as they had been more completely disguised under the influence of the resistances. These surrogates must, however, show a certain similarity with the ideas which are the object of our search, by

virtue of their nature as symptoms; and when the resistance is not too intensive it is possible from the nature of these irruptions to discover the hidden object of our search. This must be related to the repressed thought as a sort of allusion, as a statement of the same thing in *indirect* terms.

We know cases in normal psychology in which analogous situations to the one which we have assumed give rise to similar experiences. Such a case is that of wit. By my study of psychoanalytic technique I was necessarily led to a consideration of the problem of the nature of wit. I will give one example of this sort, which, too, is a story that originally appeared in English.

The anecdote runs: ¹Two unscrupulous business men had succeeded by fortunate speculations in accumulating a large fortune, and then directed their efforts to breaking into good society. Among other means they thought it would be of advantage to be painted by the most famous and expensive artist of the city, a man whose paintings were considered as events. The costly paintings were first shown at a great soirée and both hosts led the most influential connoisseur and art critic to the wall of the salon on which the portraits were hung, to elicit his admiring judgment. The artist looked for a long time, looked about as though in search of something, and then merely asked, pointing out the vacant space between the two pictures; "And where is the Saviour?"

I see that you are all laughing over this good example of wit, which we will now attempt to analyse. We understand that the critic means to say; "You are a couple of malefactors, like those between whom the Saviour was crucified." But he does not say this, he expresses himself instead in a way that at first seems not to the purpose and not related to the matter in hand, but which at the next moment we recognize as an *allusion* to the insult at which he aims, and as a perfect surrogate for it. We cannot expect to find in the case of wit all those relations that our theory supposes for the origin of the irruptive ideas of our patients, but it is my desire to lay stress on the similar motivation of wit and irruptive idea. Why does not the critic say directly what he has to say to the two rogues? Because, in addition to his desire to say it straight out, he is actuated by strong opposite motives. It is a proceeding which is liable to be dangerous to offend people who are one's hosts, and who can call to their aid the strong arms of numerous servants. One might easily suffer the same fate that I used in the previous lecture to illustrate repression. On this ground,

¹Der Witz und seine Beziehung zum Unbewussten. Deuticke, Vienna, 1905, p. 59.

the critic does not express the particular insult directly, but in a disguised form, as an allusion with omission. The same constellation comes into play, according to our hypothesis, when our patient produces the irruptive idea as a surrogate for the forgotten idea which is the object of the quest.

Ladies and gentlemen, it is very useful to designate a group of ideas which belong together and have a common emotive tone, according to the custom of the Zürich school (Bleuler, Jung and others), as a "complex." So we can say that if we set out from the last memories of the patient to look for a repressed complex, that we have every prospect of discovering it, if only the patient will communicate to us a sufficient number of the ideas which come into his head. So we let the patient speak along any line that he desires, and cling to the hypothesis that nothing can occur to him except what has some indirect bearing on the complex that we are seeking. If this method of discovering the repressed complexes seems too circumstantial, I can at least assure you that it is the only available one.

In practicing this technique, one is further bothered by the fact that the patient often stops, is at a stand-still, and considers that he has nothing to say; nothing occurs to him. If this were really the case and the patient were right, our procedure would again be proven inapplicable. Closer observation shows that such an absence of ideas never really occurs, and that it only appears to when the patient holds back or rejects the idea which he perceives, under the influence of the resistance, which disguises itself as critical judgment of the value of the idea. The patient can be protected from this if he is warned in advance of this circumstance, and told to take no account of the critical attitude. He must say anything that comes into his mind, fully laying aside such critical choice, even though he may think it unessential, irrelevant, nonsensical, especially when the idea is one which is unpleasant to dwell on. By following this prescription we secure the material which sets us on the track of the repressed complex.

These irruptive ideas, which the patient himself values little, if he is under the influence of the resistance and not that of the physician, are for the psychologist like the ore, which by simple methods of interpretation he reduces from its crude state to valuable metal. If one desires to gain in a short time a preliminary knowledge of the patient's repressed complexes, without going into the question of their arrangement and associations, this examination may be conducted with the help of the association experiments, as Jung¹ and his pupils have per-

¹C. G. Jung: *Diagnostische Assoziationsstudien*, B. 1, 1906.

fected them. This procedure is to the psychologist what qualitative analysis is to the chemist; it may be dispensed with in the therapy of neurotic patients, but is indispensable in the investigations of the psychoses, which have been begun by the Zürich school with such valuable results.

This method of work with whatever comes into the patient's head when he submits to psychoanalytic treatment, is not the only technical means at our disposal for the widening of consciousness. Two other methods of procedure serve the same purpose, the interpretation of his dreams and the evaluation of acts which he bungles or does without intending to (*Fehl- und Zufallshandlungen*).

I might say, esteemed hearers, that for a long time I hesitated whether instead of this hurried survey of the whole field of psychoanalysis, I should not rather offer you a thorough consideration of the analysis of dreams; a purely subjective and apparently secondary motive decided me against this. It seemed rather an impropriety that in this country, so devoted to practical pursuits, I should pose as "interpreter of dreams," before you had a chance to discover what significance the old and despised art can claim.

Interpretation of dreams is in fact the *via regia* to the interpretation of the unconscious, the surest ground of psychoanalysis and a field in which every worker must win his convictions and gain his education. If I were asked how one could become a psychoanalyst, I should answer, through the study of his own dreams. With great tact all opponents of the psychoanalytic theory have so far either evaded any criticism of the "*Traumdeutung*"¹ or have attempted to pass over it with the most superficial objections. If, on the contrary, you will undertake the solution of the problems of dream life, the novelties which psychoanalysis present to your thoughts will no longer be difficulties.

You must remember that our nightly dream productions show the greatest outer similarity and inner relationship to the creations of the insane, but on the other hand are compatible with full health during waking life. It does not sound at all absurd to say that whoever regards these normal sense illusions, these delusions and alterations of character as matter for amazement instead of understanding, has not the least prospect of understanding the abnormal creations of diseased mental states in any other than the lay sense. You may with confidence place in this lay group all the psychiatrists of to-day. Follow me now on a brief excursion through the field of dream problems.

¹Die Traumdeutung: 2d edition. Deuticke, Vienna, 1909.

In our waking state we usually treat dreams with as little consideration as the patient treats the irruptive ideas which the psychoanalyst demands from him. It is evident that we reject them, for we forget them quickly and completely. The slight valuation which we place on them is based, with those dreams that are not confused and nonsensical, on the feeling that they are foreign to our personality, and, with other dreams, on their evident absurdity and senselessness. Our rejection derives support from the unrestrained shamelessness and the immoral longings which are obvious in many dreams. Antiquity, as we know, did not share this light valuation of dreams. The lower classes of our people to-day stick close to the value which they set on dreams; they, however, expect from them, as did the ancients, the revelation of the future. I confess that I see no need to adopt mystical hypotheses to fill out the gaps in our present knowledge, and so I have never been able to find anything that supported the hypothesis of the prophetic nature of dreams. Many other things, which are wonderful enough, can be said about them.

And first, not all dreams are so foreign to the character of the dreamer, are incomprehensible and confused. If you will undertake to consider the dreams of young children from the age of a year and a half on, you will find them quite simple and easy to interpret. The young child always dreams of the fulfillment of wishes which were aroused in him the day before and were not satisfied. You need no art of interpretation to discover this simple solution, you only need to inquire into the experiences of the child on the day before (the "dream day"). Now it would certainly be a most satisfactory solution of the dream-riddle, if the dreams of adults, too, were the same as those of children, fulfillments of wishes which had been aroused in them during the dream day. This is actually the fact; the difficulties which stand in the way of this solution can be removed step by step by a thorough analysis of the dream.

There is, first of all, the most weighty objection, that the dreams of adults generally have an incomprehensible content, which shows wish-fulfillment least of anything. The answer is this: these dreams have undergone a process of disguise, the psychic content which underlies them was originally meant for quite different verbal expression. You must differentiate between the *manifest dream-content*, which we remember in the morning only confusedly, and with difficulty clothe in words which seem arbitrary, and the *latent dream-thoughts*, whose presence in the unconscious we must assume. This distortion of the dream (*Traumstellung*) is the same process which has been revealed to you in the investigations of the creations

(*symptoms*) of hysterical subjects; it points to the fact that the same opposition of psychic forces has its share in the creation of dreams as in the creation of symptoms.

The manifest dream-content is the disguised surrogate for the unconscious dream thoughts, and this disguising is the work of the defensive forces of the ego, of the resistances. These prevent the repressed wishes from entering consciousness during the waking life, and even in the relaxation of sleep they are still strong enough to force them to hide themselves by a sort of masquerading. The dreamer, then, knows just as little the sense of his dream as the hysterical knows the relation and significance of his symptoms. That there are latent dream-thoughts and that between them and the manifest dream-content there exists the relation just described—of this you may convince yourselves by the analysis of dreams, a procedure the technique of which is exactly that of psychoanalysis. You must abstract entirely from the apparent connection of the elements in the manifest dream and seek for the irruptive ideas which arise through free association, according to the psychoanalytic laws, from each separate dream element. From this material the latent dream thoughts may be discovered, exactly as one divines the concealed complexes of the patient from the fancies connected with his symptoms and memories. From the latent dream thoughts which you will find in this way, you will see at once how thoroughly justified one is in interpreting the dreams of adults by the same rubrics as those of children. What is now substituted for the manifest dream-content is the real sense of the dream, is always clearly comprehensible, associated with the impressions of the day before, and appears as the fulfilling of an unsatisfied wish. The manifest dream, which we remember after waking, may then be described as a *disguised* fulfillment of *repressed* wishes.

It is also possible by a sort of synthesis to get some insight into the process which has brought about the disguise of the unconscious dream thoughts as the manifest dream-content. We call this process "dream-work" (*Traumarbeit*). This deserves our fullest theoretical interest, since here as nowhere else we can study the unsuspected psychic processes which are existent in the unconscious, or, to express it more exactly, *between* two such separate systems as the conscious and the unconscious. Among these newly discovered psychic processes, two, condensation (*Verdichtung*) and displacement or transvaluation, change of psychic accent (*Verschiebung*), stand out most prominently. Dream work is a special case of the reaction of different mental groupings on each other, and as such is the consequence of psychic fission. In all essential points it seems identical with the work of disguise, which

changes the repressed complex in the case of failing repression into symptoms.

You will furthermore discover by the analysis of dreams, most convincingly your own, the unsuspected importance of the rôle which impressions and experiences from early childhood exert on the development of men. In the dream life the child, as it were, continues his existence in the man, with a retention of all his traits and wishes, including those which he was obliged to allow to fall into disuse in his later years. With irresistible might it will be impressed on you by what processes of development, of repression, sublimation and reaction there arises out of the child, with its peculiar gifts and tendencies, the so-called normal man, the bearer and partly the victim of our painfully acquired civilization. I will also direct your attention to the fact that we have discovered from the analysis of dreams that the unconscious makes use of a sort of symbolism, especially in the presentation of sexual complexes. This symbolism in part varies with the individual, but in part is of a typical nature, and seems to be identical with the symbolism which we suppose to lie behind our myths and legends. It is not impossible that these latter creations of the people may find their explanation from the study of dreams.

Finally, I must remind you that you must not be led astray by the objection that the occurrence of anxiety-dreams (*Angstträume*), contradicts our idea of the dream as a wish-fulfillment. Apart from the consideration that anxiety-dreams also require interpretation before judgment can be passed on them, one can say quite generally that the anxiety does not depend in such a simple way on the dream content as one might suppose without more knowledge of the facts, and more attention to the conditions of neurotic anxiety. Anxiety is one of the ways in which the ego relieves itself of repressed wishes which have become too strong, and so is easy to explain in the dream, if the dream has gone too far towards the fulfilling of the objectionable wish.

You see that the investigation of dreams was justified by the conclusions which it has given us concerning things otherwise hard to understand. But we came to it in connection with the psychoanalytic treatment of neurotics. From what has been said you can easily understand how the interpretation of dreams, if it is not made too difficult by the resistance of the patient, can lead to a knowledge of the patient's concealed and repressed wishes and the complexes which he is nourishing. I may now pass to that group of everyday mental phenomena whose study has become a technical help for psychoanalysis.

These are the bungling of acts (*Fehlhandlungen*) among

normal men as well as among neurotics, to which no significance is ordinarily attached; the forgetting of things which one is supposed to know and at other times really does know (for example the temporary forgetting of proper names); mistakes in speaking (*Versprechen*), which occur so frequently; analogous mistakes in writing (*Verschreiben*) and in reading (*Verlesen*), the automatic execution of purposive acts in wrong situations (*Vergreifen*) and the loss or breaking of objects, etc. These are trifles, for which no one has ever sought a psychological determination, which have passed unchallenged as chance experiences, as consequences of absent-mindedness, inattention and similar conditions. Here, too, are included the acts and gestures executed without being noticed by the subject, to say nothing of the fact that he attaches no psychic importance to them; as playing and trifling with objects, humming melodies, handling one's person and clothing and the like.¹

These little things, the bungling of acts, like the symptomatic and chance acts (*Symptom- und Zufallshandlungen*) are not so entirely without meaning as is generally supposed by a sort of tacit agreement. They have a meaning, generally easy and sure to interpret from the situation in which they occur, and it can be demonstrated that they either express impulses and purposes which are repressed, hidden if possible from the consciousness of the individual, or that they spring from exactly the same sort of repressed wishes and complexes which we have learned to know already as the creators of symptoms and dreams.

It follows that they deserve the rank of symptoms, and their observation, like that of dreams, can lead to the discovery of the hidden complexes of the psychic life. With their help one will usually betray the most intimate of his secrets. If these occur so easily and commonly among people in health, with whom repression has on the whole succeeded fairly well, this is due to their insignificance and their inconspicuous nature. But they can lay claim to high theoretic value, for they prove the existence of repression and surrogate creations even under the conditions of health. You have already noticed that the psychoanalyst is distinguished by an especially strong belief in the determination of the psychic life. For him there is in the expressions of the psyche nothing trifling, nothing arbitrary and lawless, he expects everywhere a widespread motivation, where customarily such claims are not made; more than that, he is even prepared to find a manifold motivation of these

¹Zur Psychopathologie des Alltagslebens. 3d edition, 1910. S. Karger, Berlin.

psychic expressions, while our supposedly inborn causal need is satisfied with a single psychic cause.

Now keeping in mind the means which we possess for the discovery of the hidden, forgotten, repressed things in the soul life: the study of the irruptive ideas called up by free association, the patient's dreams, and his bungled and symptomatic acts; and adding to these the evaluation of other phenomena which emerge during the psychoanalytic treatment, on which I shall later make a few remarks under the heading of "transfer" (*Uebertragung*), you will come with me to the conclusion that our technique is already sufficiently efficacious for the solution of the problem of how to introduce the pathogenic psychic material into consciousness, and so to do away with the suffering brought on by the creation of surrogate symptoms.

The fact that by such therapeutic endeavors our knowledge of the mental life of the normal and the abnormal is widened and deepened, can of course only be regarded as an especial attraction and superiority of this method.

I do not know whether you have gained the impression that the technique through whose arsenal I have led you is a peculiarly difficult one. I consider that on the contrary, for one who has mastered it, it is quite adapted for use. But so much is sure, that it is not obvious, that it must be learned no less than the histological or the surgical technique.

You may be surprised to learn that in Europe we have heard very frequently judgments passed on psychoanalysis by persons who knew nothing of its technique and had never practised it, but who demanded scornfully that we show the correctness of our results. There are among these people some who are not in other things unacquainted with scientific methods of thought, who for example would not reject the result of a microscopical research because it cannot be confirmed with the naked eye in anatomical preparations, and who would not pass judgment until they had used the microscope. But in matters of psychoanalysis circumstances are really more unfavorable for gaining recognition. Psychoanalysis will bring the repressed in mental life to conscious acknowledgment, and every one who judges it is himself a man who has such repressions, perhaps only maintained with difficulty. It will consequently call forth the same resistances from him as from the patient, and this resistance can easily succeed in disguising itself as intellectual rejection, and bring forward arguments similar to those from which we protect our patients by the basic principles of psychoanalysis. It is not difficult to substantiate in our opponents the same impairment of intelligence produced by emotivity which we may observe every day with our patients.

The arrogance of consciousness which for example rejects dreams so lightly, belongs—quite generally—to the strongest protective apparatus which guards us against the breaking through of the unconscious complexes, and as a result it is hard to convince people of the reality of the unconscious, and to teach them anew, what their conscious knowledge contradicts.

FOURTH LECTURE

Ladies and Gentlemen: At this point you will be asking what the technique which I have described has taught us of the nature of the pathogenic complexes and repressed wishes of neurotics.

One thing in particular: psychoanalytic investigations trace back the symptoms of disease with really surprising regularity to impressions from the sexual life, show us that the pathogenic wishes are of the nature of erotic impulse-components (*Triebkomponente*), and necessitate the assumption that to disturbances of the erotic sphere must be ascribed the greatest significance among the etiological factors of the disease. This holds of both sexes.

I know that this assertion will not willingly be credited. Even those investigators who gladly follow my psychological labors, are inclined to think that I overestimate the etiological share of the sexual moments. They ask me why other mental excitations should not lead to the phenomena of repression and surrogate-creation which I have described. I can give them this answer; that I do not know why they should not do this, I have no objection to their doing it, but experience shows that they do not possess such a significance, and that they merely support the effect of the sexual moments, without being able to supplant them. This conclusion was not a theoretical postulate; in the *Studien über Hysterie*, published in 1895 with Dr. Breuer, I did not stand on this ground. I was converted to it when my experience was richer and had led me deeper into the nature of the case. Gentlemen, there are among you some of my closest friends and adherents, who have travelled to Worcester with me. Ask them, and they will tell you that they all were at first completely sceptical of the assertion of the determinative significance of the sexual etiology, until they were compelled by their own analytic labors to come to the same conclusion.

The conduct of the patients does not make it any easier to convince one's self of the correctness of the view which I have expressed. Instead of willingly giving us information concerning their sexual life, they try to conceal it by every means in their power. Men generally are not candid in sexual mat-

ters. They do not show their sexuality freely, but they wear a thick overcoat—a fabric of lies—to conceal it, as though it were bad weather in the world of sex. And they are not wrong; sun and wind are not favorable in our civilized society to any demonstration of sex life. In truth no one can freely disclose his erotic life to his neighbor. But when your patients see that in your treatment they may disregard the conventional restraints, they lay aside this veil of lies, and then only are you in a position to formulate a judgment on the question in dispute. Unfortunately physicians are not favored above the rest of the children of men in their personal relationship to the questions of the sex life. Many of them are under the ban of that mixture of prudery and lasciviousness which determines the behaviour of most *Kulturmenschen* in affairs of sex.

Now to proceed with the communication of our results. It is true that in another series of cases psychoanalysis at first traces the symptoms back not to the sexual, but to banal traumatic experiences. But the distinction loses its significance through other circumstances. The work of analysis which is necessary for the thorough explanation and complete cure of a case of sickness does not stop in any case with the experience of the time of onset of the disease, but in every case it goes back to the adolescence and the early childhood of the patient. Here only do we hit upon the impressions and circumstances which determine the later sickness. Only the childhood experiences can give the explanation for the sensitivity to later traumata and only when these memory traces, which almost always are forgotten, are discovered and made conscious, is the power developed to banish the symptoms. We arrive here at the same conclusion as in the investigation of dreams—that it is the incompatible, repressed wishes of childhood which lend their power to the creation of symptoms. Without these the reactions upon later traumata discharge normally. But we must consider these mighty wishes of childhood very generally as sexual in nature.

Now I can at any rate be sure of your astonishment. Is there an infantile sexuality? you will ask. Is childhood not rather that period of life which is distinguished by the lack of the sexual impulse? No, gentlemen, it is not at all true that the sexual impulse enters into the child at puberty, as the devils in the gospel entered into the swine. The child has his sexual impulses and activities from the beginning, he brings them with him into the world, and from these the so-called normal sexuality of adults emerges by a significant development through manifold stages. It is not very difficult to observe the expressions of this childish sexual activity; it needs

rather a certain art to overlook them or to fail to interpret them.¹

As fate would have it, I am in a position to call a witness for my assertions from your own midst. I show you here the work of one Dr. Sanford Bell, published in 1902 in the *American Journal of Psychology*. The author was a fellow of Clark University, the same institution within whose walls we now stand. In this thesis, entitled "A Preliminary Study of the Emotion of Love between the Sexes," which appeared three years before my "Drei Abhandlungen zur Sexualtheorie," the author says just what I have been saying to you: "The emotion of sex love . . . does not make its appearance for the first time at the period of adolescence as has been thought." He has, as we should say in Europe, worked by the American method, and has gathered not less than 2,500 positive observations in the course of fifteen years, among them 800 of his own. He says of the signs by which this amorous condition manifests itself: "The unprejudiced mind, in observing these manifestations in hundreds of couples of children, cannot escape referring them to sex origin. The most exacting mind is satisfied when to these observations are added the confessions of those who have as children experienced the emotion to a marked degree of intensity, and whose memories of childhood are relatively distinct." Those of you who are unwilling to believe in infantile sexuality will be most astonished to hear that among those children who fell in love so early not a few are of the tender ages of three, four, and five years.

It would not be surprising if you should believe the observations of a fellow-countryman rather than my own. Fortunately a short time ago from the analysis of a five-year-old boy who was suffering from anxiety, an analysis undertaken with correct technique by his own father,² I succeeded in getting a fairly complete picture of the bodily expressions of the impulse and the mental productions of an early stage of childish sexual life. And I must remind you that my friend, Dr. C. G. Jung, read you a few hours ago in this room an observation on a still younger girl who from the same cause as my patient—the birth of a little child in the family—betrayed certainly almost the same secret excitement, wish and complex-creation. Accordingly I am not without hope that you may feel friendly toward this idea of infantile sexuality that was so strange at first. I might also quote the remarkable example of the Zürich psychiatrist, E. Bleuler, who said a few years

¹ Drei Abhandlungen zur Sexualtheorie. Wien, F. Deuticke, 1908, 2d ed.

² Analyse der Phobie eines 5-jährigen Knaben. Jahrbuch f. psychoanalytische u. psychopathologische Forschungen. B. I, H. I., 1909.

ago openly that he faced my sexual theories incredulous and bewildered, and since that time by his own observations had substantiated them in their whole scope.¹ If it is true that most men, medical observers and others, do not want to know anything about the sexual life of the child, the fact is capable of explanation only too easily. They have forgotten their own infantile sexual activity under the pressure of education for civilization and do not care to be reminded now of the repressed material. You will be convinced otherwise if you begin the investigation by a self-analysis, by an interpretation of your own childhood memories.

Lay aside your doubts and let us evaluate the infantile sexuality of the earliest years.² The sexual impulse of the child manifests itself as a very complex one, it permits of an analysis into many components, which spring from different sources. It is entirely disconnected from the function of reproduction which it is later to serve. It permits the child to gain different sorts of pleasure sensations, which we include, by the analogues and connections which they show, under the term sexual pleasures. The great source of infantile sexual pleasure is the auto-excitation of certain particularly sensitive parts of the body; besides the genitals are included the rectum and the opening of the urinary canal, and also the skin and other sensory surfaces. Since in this first phase of child sexual life the satisfaction is found on the child's own body and has nothing to do with any other object, we call this phase after a word coined by Havelock Ellis, that of "auto-erotism." The parts of the body significant in giving sexual pleasure we call "erogenous zones." The thumb-sucking (*Ludeln*) or passionate sucking (*Wonnesaugen*) of very young children is a good example of such an auto-erotic satisfaction of an erogenous zone. The first scientific observer of this phenomenon, a specialist in children's diseases in Budapest by the name of Lindner, interpreted these rightly as sexual satisfaction and described exhaustively their transformation into other and higher forms of sexual gratification.³ Another sexual satisfaction of this time of life is the excitation of the genitals by masturbation, which has such a great significance for later life and, in the case of many individuals, is never fully overcome. Besides this and other auto-erotic manifestations we see very early in the child the impulse-components of *sexual pleasure*, or, as we may say, of the *libido*, which presupposes a second person as its object. These impulses appear in opposed pairs,

¹ Bleuler: Sexuelle Abnormitäten der Kinder. Jahrbuch der schweizer, Gesellschaft für Schulgesundheitspflege. IX, 1908.

² Drei Abhandlungen zur Sexualtheorie, Vienna, 1910, 2d ed.

³ Jahrbuch f. Kinderheilkunde, 1879.

as active and passive. The most important representatives of this group are the pleasure in inflicting pain (sadism) with its passive opposite (masochism) and active and passive exhibition-pleasure (*Schaulust*). From the first of these later pairs splits off the curiosity for knowledge, as from the latter the impulse toward artistic and theatrical representation. Other sexual manifestations of the child can already be regarded from the view-point of object-choice, in which the second person plays the prominent part. The significance of this was primarily based upon motives of the impulse of self-preservation. The difference between the sexes plays, however, in the child no very great rôle. One may attribute to every child, without wronging him, a bit of the homosexual disposition.

The sexual life of the child, rich, but dissociated, in which each single impulse goes about the business of arousing pleasure independently of every other, is later correlated and organized in two general directions, so that by the close of puberty the definite sexual character of the individual is practically finally determined. The single impulses subordinate themselves to the overlordship of the genital zone, so that the whole sexual life is taken over into the service of procreation, and their gratification is now significant only so far as they help to prepare and promote the true sexual act. On the other hand, object-choice prevails over auto-erotism, so that now in the sexual life all components of the sexual impulse are satisfied in the loved person. But not all the original impulse-components are given a share in the final shaping of the sexual life. Even before the advent of puberty certain impulses have undergone the most energetic repression under the impulse of education, and mental forces like shame, disgust and morality are developed, which, like sentinels, keep the repressed wishes in subjection. When there comes, in puberty, the high tide of sexual desire it finds dams in this creation of reactions and resistances. These guide the outflow into the so-called normal channels, and make it impossible to revivify the impulses which have undergone repression.

The most important of these repressed impulses are koprophilism, that is, the pleasure in children connected with the excrements; and, further, the tendencies attaching themselves to the persons of the primitive object-choice.

Gentlemen, a sentence of general pathology says that every process of development brings with it the germ of pathological dispositions in so far as it may be inhibited, delayed, or incompletely carried out. This holds for the development of the sexual function, with its many complications. It is not smoothly completed in all individuals, and may leave behind either abnormalities or disposition to later diseases by the way

of later falling back or *regression*. It may happen that not all the partial impulses subordinate themselves to the rule of the genital zone. Such an impulse which has remained disconnected brings about what we call a perversion, which may replace the normal sexual goal by one of its own. It may happen, as has been said before, that the auto-erotism is not fully overcome, as many sorts of disturbances testify. The originally equal value of both sexes as sexual objects may be maintained and an inclination to homosexual activities in adult life result from this, which, under suitable conditions, rises to the level of exclusive homosexuality. This series of disturbances corresponds to the direct inhibition of development of the sexual function, it includes the perversions and the general *infantilism* of the sex life that are not seldom met with.

The disposition to neuroses is to be derived in another way from an injury to the development of the sex life. The neuroses are related to the perversions as the negative to the positive; in them we find the same impulse-components as in perversions, as bearers of the complexes and as creators of the symptoms; but here they work from out the unconscious. They have undergone a repression, but in spite of this they maintain themselves in the unconscious. Psychoanalysis teaches us that overstrong expression of the impulse in very early life leads to a sort of fixation (*Fixierung*), which then offers a weak point in the articulation of the sexual function. If the exercise of the normal sexual function meets with hindrances in later life, this repression, dating from the time of development, is broken through at just that point at which the infantile fixation took place.

You will now perhaps make the objection: "But all that is not sexuality." I have used the word in a very much wider sense than you are accustomed to understand it. This I willingly concede. But it is a question whether you do not rather use the word in much too narrow a sense when you restrict it to the realm of procreation. You sacrifice by that the understanding of perversions; of the connection between perversion, neurosis and normal sexual life; and have no means of recognizing, in its true significance, the easily observable beginning of the somatic and mental sexual life of the child. But however you decide about the use of the word, remember that the psychoanalyst understands sexuality in that full sense to which he is led by the evaluation of infantile sexuality.

Now we turn again to the sexual development of the child. We still have much to say here, since we have given more attention to the somatic than to the mental expressions of the sexual life. The primitive object-choice of the child, which is derived from his need of help, demands our further interest.

It first attaches to all persons to whom he is accustomed, but soon these give way in favor of his parents. The relation of the child to his parents is, as both direct observation of the child and later analytic investigation of adults agree, not at all free from elements of sexual accessory-excitation (*Miterregung*). The child takes both parents, and especially one, as an object of his erotic wishes. Usually he follows in this the stimulus given by his parents, whose tenderness has very clearly the character of a sex manifestation, though inhibited so far as its goal is concerned. As a rule, the father prefers the daughter, the mother the son; the child reacts to this situation, since, as son, he wishes himself in the place of his father, as daughter, in the place of the mother. The feelings awakened in these relations between parents and children, and, as a resultant of them, those among the children in relation to each other, are not only positively of a tender, but negatively of an inimical sort. The complex built up in this way is destined to quick repression, but it still exerts a great and lasting effect from the unconscious. We must express the opinion that this with its ramifications presents the *nuclear complex* of every neurosis, and so we are prepared to meet with it in a not less effectual way in the other fields of mental life. The myth of King Œdipus, who kills his father and wins his mother as a wife is only the slightly altered presentation of the infantile wish, rejected later by the opposing barriers of incest. Shakespeare's tale of Hamlet rests on the same basis of an incest complex, though better concealed. At the time when the child is still ruled by the still unrepressed nuclear complex, there begins a very significant part of his mental activity which serves sexual interest. He begins to investigate the question of where children come from and guesses more than adults imagine of the true relations by deduction from the signs which he sees. Usually his interest in this investigation is awakened by the threat to his welfare through the birth of another child in the family, in whom at first he sees only a rival. Under the influence of the partial impulses which are active in him he arrives at a number of "infantile sexual theories," as that the same male genitals belong to both sexes, that children are conceived by eating and born through the opening of the intestine, and that sexual intercourse is to be regarded as an inimical act, a sort of overpowering.

But just the unfinished nature of his sexual constitution and the gaps in his knowledge brought about by the hidden condition of the feminine sexual canal, cause the infant investigator to discontinue his work as a failure. The facts of this childish investigation itself as well as the infant sex theories created by

it are of determinative significance in the building of the child's character, and in the content of his later neuroses.

It is unavoidable and quite normal that the child should make his parents the objects of his first object-choice. But his *libido* must not remain fixed on these first chosen objects, but must take them merely as a prototype and transfer from these to other persons in the time of definite object-choice. The breaking loose (*Ablösung*) of the child from his parents is thus a problem impossible to escape if the social virtue of the young individual is not to be impaired. During the time that the repressive activity is making its choice among the partial sexual impulses and later, when the influence of the parents, which in the most essential way has furnished the material for these repressions, is lessened, great problems fall to the work of education, which at present certainly does not always solve them in the most intelligent and economic way.

Gentlemen, do not think that with these explanations of the sexual life and the sexual development of the child we have too far departed from psychoanalysis and the cure of neurotic disturbances. If you like, you may regard the psychoanalytic treatment only as a continued education for the overcoming of childhood-remnants (*Kindheitsresten*).

FIFTH LECTURE

Ladies and Gentlemen: With the discovery of infantile sexuality and the tracing back of the neurotic symptoms to erotic impulse-components we have arrived at several unexpected formulæ for expressing the nature and tendencies of neurotic diseases. We see that the individual falls ill when in consequence of outer hindrances or inner lack of adaptability the satisfaction of the erotic needs in the sphere of reality is denied. We see that he then flees to sickness, in order to find with its help a surrogate satisfaction for that denied him. We recognize that the symptoms of illness contain fractions of the sexual activity of the individual, or his whole sexual life, and we find in the turning away from reality the chief tendency and also the chief injury of the sickness. We may guess that the resistance of our patients against the cure is not a simple one, but is composed of many motives. Not only does the ego of the patient strive against the giving up of the repressions by which it has changed itself from its original constitution into its present form, but also the sexual impulses may not renounce their surrogate satisfaction so long as it is not certain that they can be offered anything better in the sphere of reality.

The flight from the unsatisfying reality into what we call,

on account of its biologically injurious nature, disease, but which is never without an individual gain in pleasure for the patient, takes place over the path of regression, the return to earlier phases of the sexual life, when satisfaction was not lacking. This regression is seemingly a twofold one, a *temporal*, in so far as the *libido* or erotic need falls back to a temporally earlier stage of development, and a *formal*, since the original and primitive psychic means of expression are applied to the expression of this need. Both sorts of regression focus in childhood and have their common point in the production of an infantile condition of sexual life.

The deeper you penetrate into the pathogenesis of neurotic diseases, the more the connection of neuroses with other products of human mentality, even the most valuable, will be revealed to you. You will be reminded that we men, with the high claims of our civilization and under the pressure of our repressions, find reality generally quite unsatisfactory and so keep up a life of fancy in which we love to compensate for what is lacking in the sphere of reality by the production of wish-fulfillments. In these phantasies is often contained very much of the particular constitutional essence of personality and of its tendencies, repressed in real life. The energetic and successful man is he who succeeds by dint of labor in transforming his wish fancies into reality. Where this is not successful in consequence of the resistance of the outer world and the weakness of the individual, there begins the turning away from reality. The individual takes refuge in his satisfying world of fancy. Under certain favorable conditions it still remains possible for him to find another connecting link between these fancies and reality, instead of permanently becoming a stranger to it through the regression into the infantile. If the individual who is displeased with reality is in possession of that *artistic talent* which is still a psychological riddle, he can transform his fancies into artistic creations. So he escapes the fate of a neurosis and wins back his connection with reality by this round-about way.¹ Where this opposition to the real world exists, but this valuable talent fails or proves insufficient, it is unavoidable that the *libido*, following the origin of the fancies, succeeds by means of regression in revivifying the infantile wishes and so producing a neurosis. The neurosis takes, in our time, the place of the cloister, in which were accustomed to take refuge all those whom life had undeceived or who felt themselves too weak for life. Let me give at this point the main result at which we have arrived by the psycho-

¹ Compare, Rank, Otto: *Der Künstler, Ansätze zu einer Sexual-Psychologie*. 56 p. Heller & Co., Wien, 1907.

analytic investigation of neurotics, namely, that neuroses have no peculiar psychic content of their own, which is not also to be found in healthy states; or, as C. G. Jung has expressed it, neurotics fall ill of the same complexes with which we sound people struggle. It depends on quantitative relationships, on the relations of the forces wrestling with each other, whether the struggle leads to health, to a neurosis, or to compensatory over-functioning (*Ueberleistung*).

Ladies and gentlemen, I have still withheld from you the most remarkable experience which corroborates our assumptions of the sexual impulse-forces of neurotics. Every time that we treat a neurotic psychoanalytically, there occurs in him the so-called phenomenon of *transfer* (*Uebertragung*), that is, he applies to the person of the physician a great amount of tender emotion, often mixed with enmity, which has no foundation in any real relation, and must be derived in every respect from the old wish-fancies of the patient which have become unconscious. Every fragment of his emotive life, which can no longer be called back into memory, is accordingly lived over by the patient in his relations to the physician, and only by such a living of them over in the "transfer" is he convinced of the existence and the power of these unconscious sexual excitations. The symptoms, which, to use a simile from chemistry, are the precipitates of earlier love experiences (in the widest sense), can only be dissolved in the higher temperature of the experience of transfer and transformed into other psychic products. The physician plays in this reaction, to use an excellent expression of S. Ferenczi,¹ the rôle of a *catalytic ferment*, which temporarily attracts to itself the affect which has become free in the course of the process.

The study of transfer can also give you the key to the understanding of hypnotic suggestion, which we at first used with our patients as a technical means of investigation of the unconscious. Hypnosis showed itself at that time to be a therapeutic help, but a hindrance to the scientific knowledge of the real nature of the case, since it cleared away the psychic resistances from a certain field, only to pile them up in an unscalable wall at the boundaries of this field. You must not think that the phenomenon of transfer, about which I can unfortunately say only too little here, is created by the influence of the psychoanalytic treatment. The transfer arises spontaneously in all human relations and in the relations of the patient to the physician; it is everywhere the especial bearer of therapeutic influences, and it works the stronger the less one knows

¹S. Ferenczi: Introduction und Uebertragung. Jahrbuch f. psychoanal. u. psychopath. Forschungen, Bd. I, H. 2., 1909.

of its presence. Accordingly psychoanalysis does not create it, it merely discloses it to consciousness, and avails itself of it, in order to direct the psychic processes to the wished for goal. But I cannot leave the theme of transfer without stressing the fact that this phenomenon is of decisive importance to convince not only the patient, but also the physician. I know that all my adherents were first convinced of the correctness of my views through their experience with transfer, and I can very well conceive that one may not win such a surety of judgment so long as he makes no psychoanalysis, and so has not himself observed the effects of transfer.

Ladies and gentlemen, I am of the opinion that there are, on the intellectual side, two hindrances to acknowledging the value of the psychoanalytic view-point: first, the fact that we are not accustomed to reckon with a strict determination of mental life, which holds without exception, and second, the lack of knowledge of the peculiarities through which unconscious mental processes differ from those conscious ones with which we are familiar. One of the most widespread resistances against the work of psychoanalysis with patients as with persons in health reduces to the latter of the two moments. One is afraid of doing harm by psychoanalysis, one is anxious about calling up into consciousness the repressed sexual impulses of the patient, as though there were danger that they could overpower the higher ethical strivings and rob him of his cultural acquisitions. One can see that the patient has sore places in his soul life, but one is afraid to touch them, lest his suffering be increased. We may use this analogy. It is, of course, better not to touch diseased places when one can only cause pain. But we know that the surgeon does not refrain from the investigation and reinvestigation of the seat of illness, if his invasion has as its aim the restoration of lasting health. Nobody thinks of blaming him for the unavoidable difficulties of the investigation or the phenomena of reaction from the operation, if these only accomplish their purpose, and gain for the patient a final cure by temporarily making his condition worse. The case is similar in psychoanalysis; it can lay claim to the same things as surgery; the increase of pain which takes place in the patient during the treatment is very much less than that which the surgeon imposes upon him, and especially negligible in comparison with the pains of serious illness. But the consequence which is feared, that of a disturbance of the cultural character by the impulse which has been freed from repression, is wholly impossible. In relation to this anxiety we must consider what our experiences have taught us with certainty, that the somatic and mental power of a wish, if once its repression has not succeeded, is incom-

parably stronger when it is unconscious than when it is conscious, so that by being made conscious it can only be weakened. The unconscious wish cannot be influenced, is free from all strivings in the contrary direction, while the conscious is inhibited by those wishes which are also conscious and which strive against it. The work of psychoanalysis accordingly presents a better substitute, in the service of the highest and most valuable cultural strivings, for the repression which has failed.

Now what is the fate of the wishes which have become free by psychoanalysis, by what means shall they be made harmless for the life of the individual? There are several ways. The general consequence is, that the wish is consumed during the work by the correct mental activity of those better tendencies which are opposed to it. The repression is supplanted by a condemnation carried through with the best means at one's disposal. This is possible, since for the most part we have to abolish only the effects of earlier developmental stages of the ego. The individual for his part only repressed the useless impulse, because at that time he was himself still incompletely organized and weak; in his present maturity and strength he can, perhaps, conquer without injury to himself that which is inimical to him. A second issue of the work of psychoanalysis may be that the revealed unconscious impulses can now arrive at those useful applications which, in the case of undisturbed development, they would have found earlier. The extirpation of the infantile wishes is not at all the ideal aim of development. The neurotic has lost, by his repressions, many sources of mental energy whose contingents would have been very valuable for his character building and his life activities. We know a far more purposive process of development, the so-called *sublimation* (*Sublimierung*), by which the energy of infantile wish-excitations is not secluded, but remains capable of application, while for the particular excitations, instead of becoming useless, a higher, eventually no longer sexual, goal is set up. The components of the sexual instinct are especially distinguished by such a capacity for the sublimation and exchange of their sexual goal for one more remote and socially more valuable. To the contributions of the energy won in such a way for the functions of our mental life we probably owe the highest cultural consequences. A repression taking place at an early period excludes the sublimation of the repressed impulse; after the removal of the repression the way to sublimation is again free.

We must not neglect, also, to glance at the third of the possible issues. A certain part of the suppressed libidinous excitation has a right to direct satisfaction and ought to find

it in life. The claims of our civilization make life too hard for the greater part of humanity, and so further the aversion to reality and the origin of neuroses, without producing an excess of cultural gain by this excess of sexual repression. We ought not to go so far as to fully neglect the original animal part of our nature, we ought not to forget that the happiness of individuals cannot be dispensed with as one of the aims of our culture. The plasticity of the sexual-components, manifest in their capacity for sublimation, may cause a great temptation to accomplish greater culture-effects by a more and more far reaching sublimation. But just as little as with our machines we expect to change more than a certain fraction of the applied heat into useful mechanical work, just as little ought we to strive to separate the sexual impulse in its whole extent of energy from its peculiar goal. This cannot succeed, and if the narrowing of sexuality is pushed too far it will have all the evil effects of a robbery.

I do not know whether you will regard the exhortation with which I close as a presumptuous one. I only venture the indirect presentation of my conviction, if I relate an old tale, whose application you may make yourselves. German literature knows a town called Schilda, to whose inhabitants were attributed all sorts of clever pranks. The wiseacres, so the story goes, had a horse, with whose powers of work they were well satisfied, and against whom they had only one grudge, that he consumed so much expensive oats. They concluded that by good management they would break him of this bad habit, by cutting down his rations by several stalks each day, until he had learned to do without them altogether. Things went finely for a while, the horse was weaned to one stalk a day, and on the next day he would at last work without fodder. On the morning of this day the malicious horse was found dead; the citizens of Schilda could not understand why he had died. We should be inclined to believe that the horse had starved, and that without a certain ration of oats no work could be expected from an animal.

I thank you for calling me here to speak, and for the attention which you have given me.

THE ASSOCIATION METHOD¹

By PROFESSOR CARL G. JUNG

Ladies and Gentlemen: When I was honored with the invitation from Clark University to lecture before this esteemed assemblage, a wish was at the same time expressed that I should speak about my methods of work, and especially about the psychology of childhood. I hope to accomplish this task in the following manner:

In my first lecture I shall try to present to you the view points of my association methods; in my second lecture I shall discuss the significance of the familiar constellations; while in my third lecture I shall enter more fully into the psychology of the child.

I might easily confine myself exclusively to my theoretical views, but I believe that it will be better to illustrate my lectures with as many practical examples as possible. We shall therefore occupy ourselves first with the method of association, a method which has been of valuable assistance to me both practically and theoretically. The association method in vogue in psychology, as well as its history, is of course, so familiar to you that there is no need to speak of it. For practical purposes I make use of the following formulary:

- | | | |
|--------------|--------------|---------------|
| 1. head | 19. pride | 37. salt |
| 2. green | 20. to cook | 38. new |
| 3. water | 21. ink | 39. custom |
| 4. to sing | 22. angry | 40. to pray |
| 5. dead | 23. needle | 41. money |
| 6. long | 24. to swim | 42. foolish |
| 7. ship | 25. voyage | 43. pamphlet |
| 8. to pay | 26. blue | 44. despise |
| 9. window | 27. lamp | 45. finger |
| 10. friendly | 28. to sin | 46. expensive |
| 11. to cook | 29. bread | 47. bird |
| 12. to ask | 30. rich | 48. to fall |
| 13. cold | 31. tree | 49. book |
| 14. stem | 32. to prick | 50. unjust |
| 15. to dance | 33. pity | 51. frog |
| 16. village | 34. yellow | 52. to part |
| 17. lake | 35. mountain | 53. hunger |
| 18. sick | 36. to die | 54. white |

¹Lectures delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909; translated from the German by Dr. A. A. Brill, of New York.

55. child	71. flower	86. false
56. to take care	72. to beat	87. anxiety
57. lead pencil	73. box	88. to kiss
58. sad	74. wild	89. bride
59. plum	75. family	90. pure
60. to marry	76. to wash	91. door
61. house	77. cow	92. to choose
62. dear	78. friend	93. hay
63. glass	79. luck	94. contented
64. to quarrel	80. lie	95. ridicule
65. fur	81. deportment	96. to sleep
66. big	82. narrow	97. month
67. carrot	83. brother	98. nice
68. to paint	84. to fear	99. woman
69. part	85. stork	100. to abuse
70. old		

This formulary has been constructed after many years of experience. The words are chosen and partially arranged in such a manner as to strike easily almost all complexes of practical occurrence. As shown by the above formulary there is a regular mixing of the grammatical qualities of the words. This, too, has its definite reasons.¹

Before the experiment begins the test person receives the following instruction: "Answer as quickly as possible the first word that occurs to your mind." This instruction is so simple that it can easily be followed by anybody. The work itself, moreover, appears extremely easy, so that it might be expected that any one could accomplish it with the greatest facility and promptitude. But contrary to expectation the behavior is quite different.

An Example of a Normal Reaction Type

Stimulus word	Reaction Time Unit 0.2 second	Reaction	Reproduction
head	9	foot	part of the body
green	11	blouse	
water	14	clear	light
to sing	6	children	
dead	11	do not like	
long	6	short	I, tall
ship	7	forth	
to pay	9	bills	
window	9	room	
friendly	10	children	
table	9	chair	room
to ask	10	all kinds	
cold	7	warm	

¹The selection of these stimulus words was naturally made for the German language only, and would probably have to be considerably changed for the English language.

An Example of Normal Reaction Type—Cont.

Stimulus word	Reaction Time Unit 0.2 second	Reaction	Reproduction
stem	6	flower	like
to dance	9	I	
lake	8	Zurich	
sick	8	sister	people
pride	6	people	
to cook	7	woman	
ink	5	black	
angry	10	children	
needle	9	to prick	like
to swim	10	healthy	
voyage	9	England	
blue	10	pretty	
lamp	6	light	
to sin	8	much	people
bread	10	good	like, necessary
rich	9	nice	
tree	6	green	
to prick	9	need	

An Example of an Hysterical Reaction Type

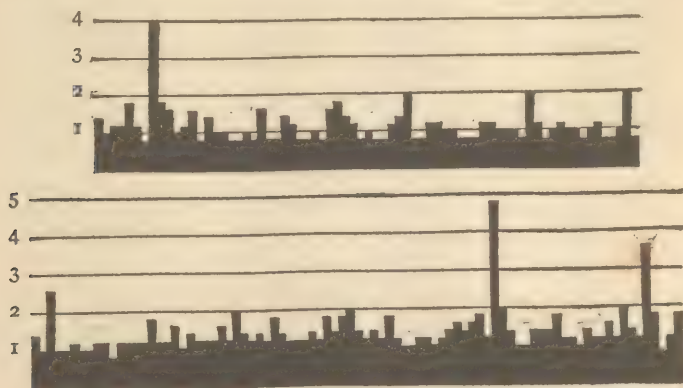
Stimulus word	Reaction Time Unit 0.2 second	Reaction	Reproduction
needle	7	to sew	ship
to swim	9	water	
voyage * †			
blue	35	to ride, motion, voyager	
lamp	10	color	
to sin	7	to burn	
	22	this idea is totally strange	
		to me, I do not recognize it	
bread	10	to eat	possession
rich †	50	money, I don't know	
brown	6	nature	
to prick	9	needle	
pity	12	feeling	
yellow	9	color	NaCl
mountain	8	high	
to die	8	to perish	
salt	15	salty (laughs) I don't know	
new	15	old	as an opposite
custom	10	good	barbaric
to pray	12	Deity	?
money	10	wealth	
foolish	12	narrow minded, restricted	
pamphlet	10	paper	

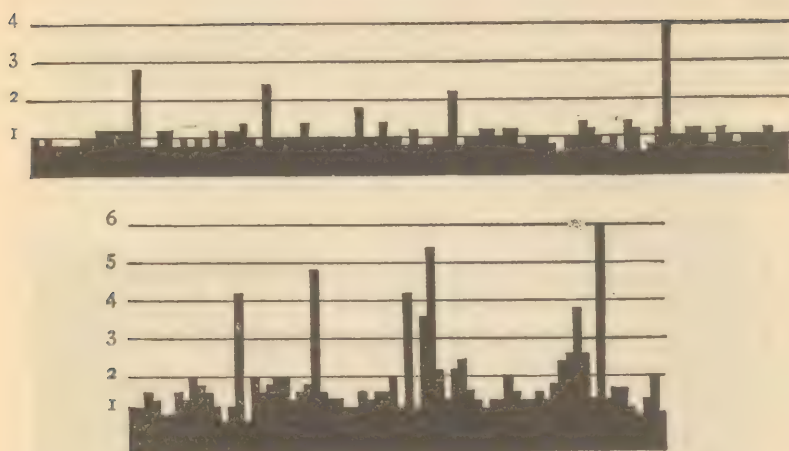
* Denotes misunderstanding. † Denotes repetition of the stimulus words.

An Example of an Hysterical Reaction Type—Cont.

Stimulus word	Reaction Time Unit 0.2 second	Reaction	Reproduction
despise	30	that is a complicated, too foolish	?
finger	8	hand, not only hand, but also foot, a joint, member, extremity	
dear	14	to pay (laughs)	
bird	8	to fly	
to fall	30	tomber, I will say no more, what do you mean by fall?	?
book	6	to read	
unjust	8	just	
frog	11	quack	
to part	30	what does part mean?	?
hunger	10	to eat	
white	12	color, everything possible, light	
child	10	little, I did not hear well, bébé	?
to take care	14	attention	
lead pencil	8	to draw, everything possible can be drawn	
sad	9	to weep, that is not always the case	to be
plum	16	to eat a plum, pluck what do you mean by it? Is that symbolic?	
to marry	27	how can you? reunion, union	fruit union alliance

The following curves illustrate the course of the reaction time in an association experiment in four normal test persons. The length of each column denotes the length of the reaction time.

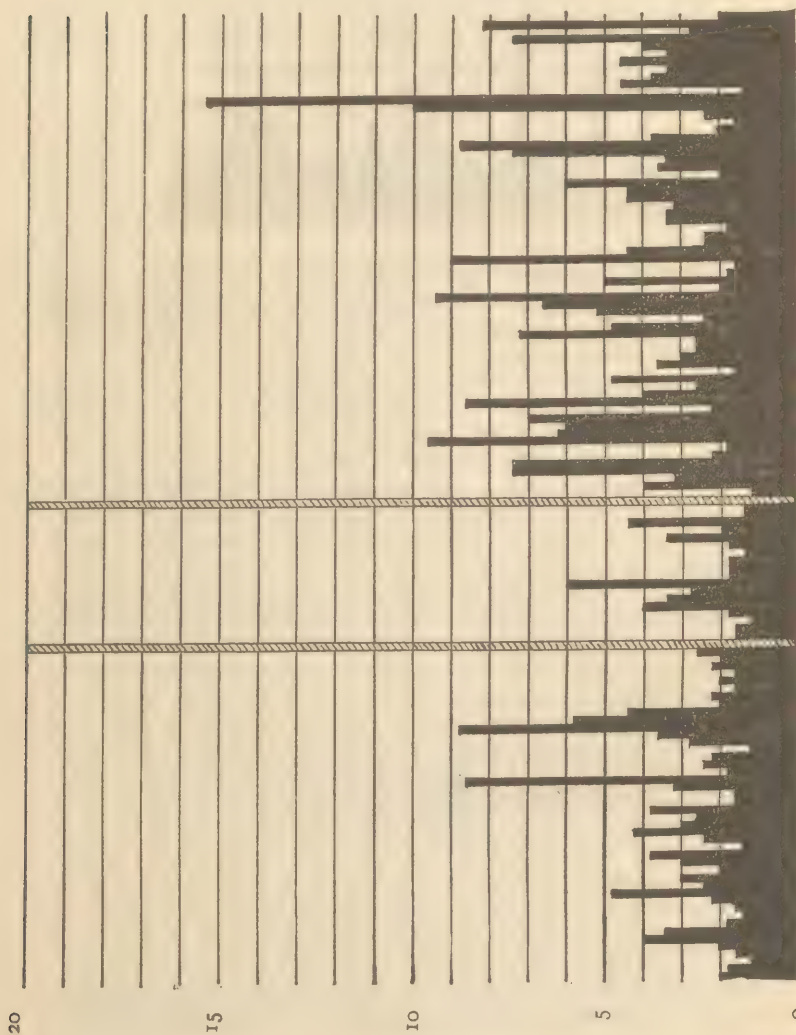




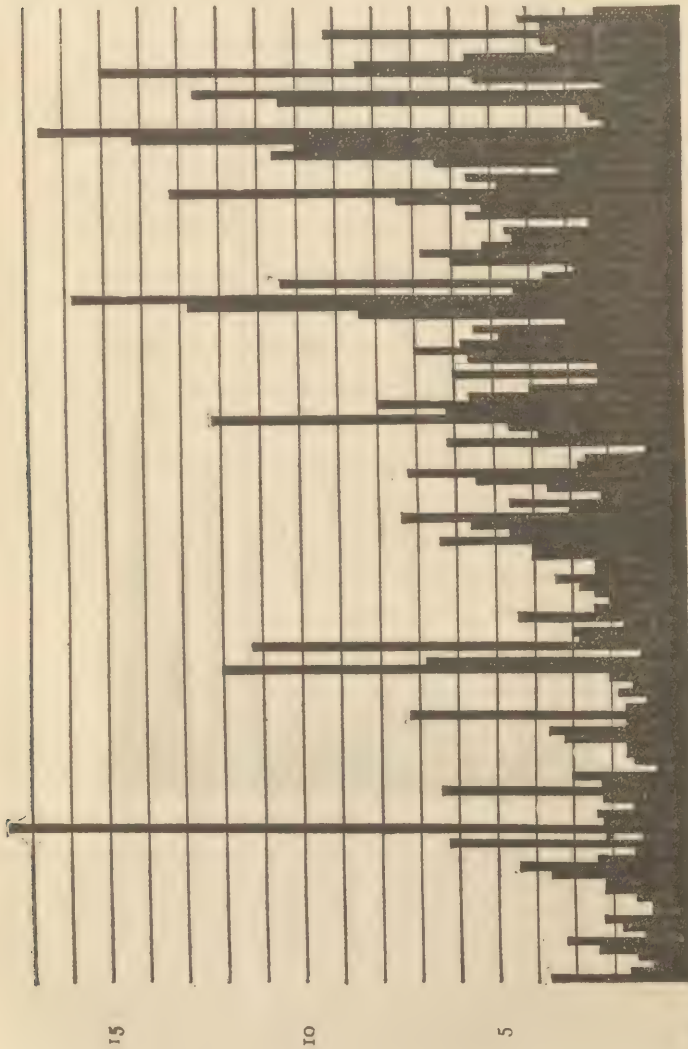
The illustrations below (pp. 224 ff.) show the course of the reaction time in hysterical individuals. The light cross-hatched columns denote the locations where the test person was unable to react (so-called failures).

The first thing that strikes us is the fact that many test persons show a marked prolongation of the reaction time. This would make us think at first of intellectual difficulties,—wrongly, however, as we are often dealing with very intelligent persons of fluent speech. The explanation lies rather in the emotions. In order to understand the matter comprehensively we must bear in mind that the association experiments cannot deal with a separated psychic function, for any psychic occurrence is never a thing in itself, but is always the resultant of the entire psychological past. The association experiment, too, is not merely a method for the reproduction of separated word couplets, but it is a kind of pastime, a conversation between experimenter and test person. In a certain sense it is even still more than that. Words are really something like condensed actions, situations, and things. When I present a word to the test person which denotes an action it is the same as if I should present to him the action itself, and ask him, “How do you behave towards it? What do you think of it? What do you do in this situation?” If I were a magician I should cause the situation corresponding to the stimulus word to appear in reality and placing the test person in its midst, I should then study his manner of reaction. The result of my stimulus words would thus undoubtedly approach infinitely nearer perfection. But as we are not magicians we must be contented with the linguistic substitutes for reality; at the same time we

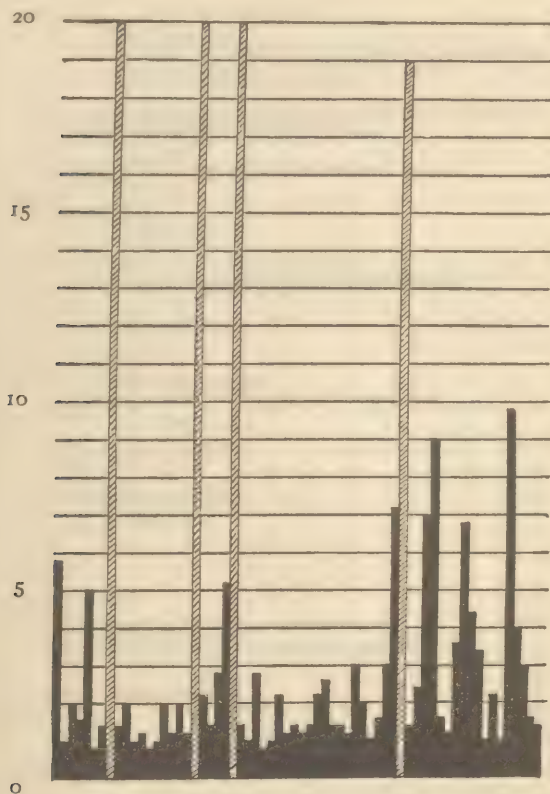
must not forget that the stimulus word will as a rule always conjure up its corresponding situation. It all depends on how the test person reacts to this situation. The situation "bride" or "bridegroom" will not evoke a simple reaction in a young lady; but the reaction will be deeply influenced by the provoked strong feeling tones, the more so if the experimenter be a man. It thus happens that the test person is often unable to react



quickly and smoothly to all stimulus words. In reality, too, there are certain stimulus words which denote actions, situations, or things, about which the test person cannot think quickly and surely, and this fact is shown in the association experiments. The example which I have just presented shows an abundance of long reaction times and other disturbances.



In this case the reaction to the stimulus word is in some way impeded, that is, the adaptation to the stimulus word is disturbed. The stimulus words are therefore merely a part of reality acting upon us; indeed, a person who shows such disturbances to the stimulus words, is in a certain sense really but imperfectly adapted to reality. Disease is an imperfect adaptation; hence in this case we are dealing with something morbid



in the psyche,—with something which is either temporary or persistently pathological, that is, we are dealing with a psychoneurosis, with a functional disturbance of the mind. This rule, however, as we shall see later, is not without its exceptions.

Let us in the first place continue the discussion concerning the prolonged reaction time. It often happens that the test person actually does *not* know what to answer to the stimulus

word. The test person waives any reaction; for the moment he totally fails to obey the original instructions, and shows himself incapable of adapting himself to the experimenter. If this phenomenon occurs frequently in an experiment it signifies a higher degree of disturbance in adjustment. I call attention to the fact that it is quite indifferent what reason the test person gives for the refusal. Some find that too many ideas suddenly occur to them, others, that not enough ideas come to their minds. In most cases, however, the difficulties first perceived are so deterrent that they actually give up the whole reaction. The following example shows a case of hysteria with many failures of reaction:

Stimulus word	Reaction Time Unit 0.2 second	Reaction	Reproduction
to sing	9	nice	+
dead	15	awful	?
long *	40	the time, the journey	?
ship †			+
to pay	11	money	
window	10	big	high
friendly	50	a man	human
to cook	10	soup	+
ink	9	black or blue	+
angry			bad
needle	9	to sew	+
lamp	14	light	+
to sin			
bread	15	to eat	+
rich * †	40	good, convenient	+
yellow	18	paper	color
mountain	10	high	+
to die	15	awful	+
salt †	25	salty	+
new			good, nice
custom †			
to pray			
money †	35	to buy, one is able	+
pamphlet	16	to write	+
to despise †	22	people	+
finger †			
dear	12	thing	+
bird	12	sings or flies	+

* Donates misunderstanding.

† Denotes repetition of the stimulus words.

In example 3 we find a characteristic phenomenon. The test person is not content with the requirements of the instruction, that is, she is not satisfied with *one* word but reacts with many words. She apparently does more and better than the instruction requires, but in so doing she does not fulfill the requirements of the instruction. Thus she reacts:—custom—good—barbaric; foolish—narrow minded—restricted; family—big—small—everything possible.

These examples show in the first place that many other words connect themselves with the reaction word. The test person is unable to suppress the ideas which subsequently occur to her. In doing this she also pursues a certain tendency which perhaps is more distinctly expressed in the following reaction: new—old—as an opposite. The addition of "as an opposite" denotes that the test person has the desire to add something explanatory or supplementary. This tendency is also shown in the following reaction: finger—not only hand, also foot—a limb—member—extremity.

Here we have a whole series of supplements. It seems as if the reaction were not sufficient for the test person, as if something else must always be added, as if what has been already said were incorrect or in some way imperfect. This feeling we may with Janet designate as the '*sentiment d'incomplétude*,' which by no means explains everything. I enter somewhat deeper into this phenomenon because it is quite frequently encountered in neurotic individuals. Indeed it is not merely a small and unimportant subsidiary manifestation in an insignificant experiment, but rather an elemental and universal manifestation which otherwise plays a rôle in the psychic life of neurotics.

With his desire to supplement the test person betrays a tendency to give the experimenter more than he wants, he even exerts the greatest efforts to seek further mental occurrences in order finally to discover something quite satisfactory. If we translate this elementary observation into the psychology of everyday life, it signifies that the test person has a tendency constantly to give to others more feeling than is required and expected. According to Freud, this is a sign of a reinforced object-libido, that is, it is a compensation for an inner unsatisfaction and voidness of feeling. In this elementary observation we therefore see one of the main qualities of hysterics, namely, the tendency to allow themselves to be carried away by everything, to attach themselves enthusiastically to everything, and to always promise too much and hence do little. Patients having this symptom, in my experience, are always hard to deal with; at first they are enthusiastically enraptured with the physician, for a time going so far as to accept everything blindly; but they soon merge into just as blind a resistance against the physician, thus rendering any educative influence absolutely impossible.

We see therefore in this phenomenon the expression of a tendency to give more than the instruction demands and expects. This tendency betrays itself also in other failures to follow the instruction:

to quarrel—angry—different things—I always quarrel at home;

to marry—how can you marry?—reunion—union;

plum—to eat—to pluck—what do you mean by it?—is it symbolic?

to sin—this idea is quite strange to me, I do not recognize it.

These reactions show that the test person gets away altogether from the situation of the experiment. For the instruction demands that he should answer only the word which next occurs to him. Here we find that the stimulus words apparently act with excessive strength, that they are taken as if they were direct personal questions. The test person entirely forgets that we deal with mere words which stand in print before us, and seeks in them a personal meaning; he tries to divine them and defend himself against them, thus altogether forgetting the instructions.

This elementary observation depicts another common peculiarity of hysterics, namely, that of taking everything personally, of never being able to remain objective, and of allowing themselves to be carried away by momentary impressions; this again shows the characteristics of the enhanced object-libido.

Another sign of impeded adaptation is the often occurring *repetitions of the stimulus words*. The test persons repeat the stimulus word as if they had not heard or understood it distinctly. They repeat it just as we repeat a difficult question in order better to grasp it before answering. This same tendency is shown in the experiment. The questions are repeated because the stimulus words act on hysterical individuals almost like difficult and personal questions. In principle it is the same phenomenon as the subsequent completion of the reaction.

In many experiments we observe that the same reaction constantly reappears to the most varied stimulus words. These words seem to possess a special reproduction tendency, and it is very interesting to examine their relationship to the test person. For example, I have observed a case in which the patient repeated the word "short" a great many times and often in places where it had no meaning. The test person could not directly state the reason for the repetition of the word "short." From experience I knew that such predicates always relate either to the test person himself or to the person nearest to him. I assumed that in this word "short" he designated himself, and that in this way he helped to express something very painful to him. The test person is of very small stature. He is the youngest of four brothers, who in contrast to him are all tall. He was always the "child" in the family, he was nicknamed "Short" and was treated by all as the "little one." This resulted in a total loss of self-confidence. Although he was intelligent, and despite long

study, he could not decide to present himself for examination; he finally became impotent, and merged into a psychosis in which, whenever he was alone, he took delight in walking about in his room on his toes in order to appear taller. The word "short," therefore, signified to him a great many painful experiences. This is usually the case with the repeated words; they always contain something very important for the individual psychology of the test person.

The signs thus far depicted are not found arbitrarily spread throughout the whole experiment, but only in very definite locations; namely, in those stimulus words which strike against special emotionally accentuated complexes. This fact is the foundation of the so-called "diagnosis of facts" (*Tatbestandsdiagnostik*); that is, of the method employed to discover by means of an association experiment, the culprit among a number of persons suspected of a crime. That this is possible I should like to demonstrate briefly in a concrete case.

On the 6th of February, 1908, our supervisor reported to me that a nurse complained to her of having been robbed during the forenoon of the previous day. The facts were as follows: The nurse kept her money, amounting to 70 francs, in a pocketbook which she had placed in her cupboard where she also kept her clothes. The cupboard contained two compartments, of which one belonged to the nurse who was robbed, and the other to the head nurse. These two nurses and a third one, who was an intimate friend of the head nurse, slept in the same room where the cupboard was. The room was in a section which was regularly occupied in common by six nurses who had free access to this room. Given such a state of affairs it is not to be wondered that the supervisor shrugged her shoulders when I asked her whom she most suspected.

Further investigation showed that on the morning of the theft the above-mentioned friend of the head nurse was slightly indisposed and remained in bed in the room the whole morning. Hence, following the indications of the plaintiff, the theft could have taken place only in the afternoon. Of the other four nurses upon whom suspicion could fall, there was only one who regularly attended to the cleaning of the room in question, while the remaining three had nothing to do in this room, nor was it shown that any of them had spent any time there on the previous day.

It was therefore natural that these last three nurses should be regarded for the time being as less implicated, and I therefore began by subjecting the first three to the experiment.

From the particulars of the case, I also knew that the cupboard was locked but that the key was kept not far away in a

very conspicuous place, that on opening the cupboard the first thing to be seen was a fur ornament (boa), and, moreover, that the pocketbook was between the linen in an inconspicuous place. The pocketbook was of dark reddish leather, and contained the following objects: one 50 franc banknote, one 20 franc piece, some centimes, one small silver watch chain, one stencil used in the insane asylum to mark the kitchen utensils, and one small receipt from Dosenbach's shoeshop in Zürich.

Besides the plaintiff and the guilty one, only the head nurse knew the exact particulars of the deed, for as soon as the former missed her money she immediately asked the head nurse to help her find it, thus the head nurse had been able to learn the smallest details, which naturally rendered the experiment still more difficult, for she was precisely the one most suspected. The conditions for the experiment were better for the others, since they knew nothing concerning the particulars of the deed, and some not even that a crime had been committed. As critical stimulus words I selected the name of the robbed nurse, plus the following words: cupboard, door, open, key, yesterday, banknote, gold, 70, 50, 20, money, watch, pocketbook, chain, silver, to hide, fur, dark reddish, leather, centimes, stencil, receipt, Dosenbach. Besides these words which referred directly to the deed, I took also the following, which had a special affective value: theft, to take, to steal, suspicion, blame, court, police, to lie, to fear, to discover, to arrest, innocent.

The objection is often made to the last species of words that they may produce a strong affective resentment even in innocent persons, and for that reason one cannot attribute to them any comparative value. Nevertheless, it may always be questioned whether the affective resentment of an innocent person will have the same effect on the association as that of a guilty one, and that question can only be authoritatively answered by experience. Until the contrary shall be demonstrated, I maintain that even words of the above mentioned type may profitably be used.

I then distributed these critical words among twice as many indifferent stimulus words in such a manner that each critical word was followed by two indifferent ones. As a rule it is well to follow up the critical words by indifferent words in order that the action of the first may be clearly distinguished. But one may also follow up one critical word by another, especially if one wishes to bring into relief the action of the second. Thus I placed together "darkish red" and "leather," and "chain" and "silver."

After this preparatory work I undertook the experiment

with the three above mentioned nurses. As examinations of this kind can be rendered into a foreign tongue only with the greatest difficulty, I will content myself with presenting the general results, and with giving some examples. I first undertook the experiment with the friend of the head nurse, and judging by the circumstances she appeared only slightly moved. The head nurse was next examined; she showed marked excitement, her pulse being 120 per minute immediately after the experiment. The last to be examined was the nurse who attended to the cleaning of the room in which the theft occurred. She was the most tranquil of the three; she displayed but little embarrassment, and only in the course of the experiment did it occur to her that she was suspected of stealing, a fact which manifestly disturbed her towards the end of the experiment.

The general impression from the examination spoke strongly against the head nurse. It seemed to me that she evinced a very "suspicious," or I might almost say, "impudent" countenance. With the definite idea of finding in her the guilty one I set about adding up the results.

One can make use of many special methods of computing, but they are not all equally good and equally exact. (One must always resort to calculation, as appearances are enormously deceptive.) The method which is most to be recommended is that of the probable average of the reaction time. It shows at a glance the difficulties which the person in the experiment had to overcome in the reaction.

The technique of this calculation is very simple. The probable average is the middle number of the various reaction times arranged in a series. The reaction times are, for example,¹ placed in the following manner: 5, 5, 5, 7, 7, 7, 7, 8, 9, 9, 9, 12, 13, 14. The number found in the middle (8) is the probable average of this series. Following the order of the experiment, I shall denote the friend of the head nurse by the letter A, the head nurse by B, and the third nurse by C.

The probable averages of the reaction are:

A	B	C
10.0	12.0	13.5

No conclusions can be drawn from this result. But the average reaction times calculated separately for the indifferent reactions, for the critical, and for those immediately following the critical (post-critical) are more interesting.

From this example we see that whereas A has the shortest reaction time for the indifferent reactions, she shows in com-

¹Reaction times are always given in fifths of a second.

The Probable Average of the Reaction Time

for	A	B	C
Indifferent reactions . . .	10.0	11.0	12.0
Critical reactions	16.0	13.0	15.0
Post-critical reactions . . .	10.0	11.0	13.0

parison to the other two persons of the experiment, the longest time for the critical reactions.

The difference between the reaction times, let us say between the indifferent and the critical, is 6 for A, 2 for B, and 3 for C, that is, it is more than double for A when compared with the other two persons.

In the same way we can calculate how many complex indicators there are on an average for the indifferent, critical, etc., reactions.

The Average Complex Indicators for each Reaction

for	A	B	C
Indifferent reactions . . .	0.6	0.9	0.8
Critical reactions	1.3	0.9	1.2
Post critical reactions . . .	0.6	1.0	0.8

The difference between the indifferent and critical reactions for A = 0.7, for B = 0, for C = 0.4. A is again the highest.

Another question to consider is, in what special way do the imperfect reactions behave?

The result for A = 34%, for B = 28%, and for C = 30%.

Here, too, A reaches the highest value, and in this, I believe, we see the characteristic moment of the guilt-complex in A. I am, however, unable to explain here circumstantially the reasons why I maintain that memory errors are related to an emotional complex, as this would lead me beyond the limits of the present work. I therefore refer the reader to my work "*Ueber die Reproduktionsstörungen im Associationsexperiment*" (IX Beitrag der Diagnost. Associat. Studien).

As it often happens that an association of strong feeling tone produces in the experiment a perseveration, with the result that not only the critical association, but also two or three successive

associations are imperfectly reproduced, it will be very interesting for our cases to see how many imperfect reproductions are so arranged in the series. The result of computation shows that the imperfect reproductions thus arranged in series are for A 64.7%, for B 55.5%, and for C 30.0%.

Again we find that A has the greatest percentage. To be sure this may partially depend on the fact that A also possesses the greatest number of imperfect reproductions. Given a small quantity of reactions it is usual that the greater the total number of the same the more imperfect reactions will occur in groups. But in order that this should be probable it could not occur in so great a measure as in our case, where on the other hand B and C have not a much smaller number of imperfect reactions when compared to A. It is significant that C with her slight emotions during the experiment shows the minimum of imperfect reproductions arranged in series.

As imperfect reproductions are also complex indicators, it is necessary to see how they distribute themselves in respect to the indifferent, critical, etc., reactions.

Imperfect Reproductions which occur

in	A	B	C
Indifferent reactions . . .	10	12	11
Critical reactions	19	9	12
Post-critical reactions . . .	5	7	7

It is hardly necessary to bring into prominence the differences between the indifferent and the critical reactions of the various subjects as shown by the resulting numbers of the table. In this respect, too, A occupies first place.

Naturally, here, too, there is a probability that the greater the quantity of the imperfect reproductions the greater is their number in the critical reactions. If we suppose that the imperfect reproductions are distributed regularly and without choice among all the reactions there will be a greater number of them for A (in comparison to B and C) even as reactions to critical words, since A has the greater number of imperfect reproductions. Admitting such a uniform distribution of the imperfect reproductions, it is easy to calculate how many we ought to expect to belong to each individual kind of reaction.

From this calculation it appears that the disturbances of reproductions which concern the critical reactions for A surpass by far the expected, for C they are 0.9 higher than the ex-

Imperfect Reproductions

Which may be expected				Which really occur		
For	Indifferent Reactions	Critical Reactions	Post-critical Reactions	Indifferent Reactions	Critical Reactions	Post-critical Reactions
A	11.2	12.5	10.2	10	19	5
B	9.2	10.3	8.4	12	9	7
C	9.9	11.1	9.0	11	12	7

pected, while for B the real number is less than the one expected.

All this points to the fact that in the subject A the critical stimulus words acted with the greatest intensity, and hence the greatest suspicion falls on A. Practically one may venture to designate such a subject as probably guilty. The same evening A made a complete confession of the theft, and thus the success of the experiment was confirmed.

I maintain that such a result should be of scientific interest and worthy of consideration. There is much in experimental psychology which is less useful than the material treated in this work. Putting aside altogether the theoretical interest, we have in this case something that is not to be despised from a practical point of view, to wit, we have brought to light the culpable affair in a much easier and shorter way than is customary. What has been possible once or twice ought to be possible again in other cases, and it is well worth while to investigate the means of rendering the method increasingly capable of rapid and sure results.

This applicability of the experiment shows it possible to strike a concealed (indeed an unconscious) complex by means of a stimulus word; and conversely we may assume with great certainty that behind a reaction which shows a complex indicator there is a hidden complex, even though the test person strongly denies it. One must get rid of the idea that educated and intelligent test persons are able to see and admit their own complexes. Every human mind contains much that is unacknowledged and hence unconscious as such; and no one can boast that he stands completely above his complexes. Those who persist in maintaining it do not see the spectacles which they wear on their noses.

It has long been thought that the association experiment

enables one to distinguish certain *intellectual* types. That is not the case. The experiment does not give us any particular insight into the purely intellectual, but rather only into the emotional processes. To be sure we can erect certain types of reaction; they are not, however, based on intellectual peculiarities, but depend entirely on the *proportionate emotional state*. Educated test persons usually show superficial and linguistically deep rooted associations, whereas the uneducated form more valuable associations and often of ingenious significance. This behavior would be paradoxical from an intellectual viewpoint. The meaningful associations of the uneducated are not really the product of intellectual thinking, but are simply the results of a special emotional state. The whole thing is more important to the uneducated, his emotion is greater and for that reason he pays more attention to the experiment than the educated person, and that is why his associations are more significant. Aside from the types determined by education we have to consider three principal individual types:

1. An objective type with undisturbed reactions.
2. A so-called complex type with many disturbances in the experiment occasioned by the constellation of a complex.
3. A so-called definition-type. This type consists in the fact that the reaction always gives an explanation or a definition of the content of the stimulus word; *e. g.*:

apple,—a tree-fruit;
table,—a piece of household furniture;
to promenade,—an activity;
father,—chief of the family.

This type is chiefly found in stupid persons, and it is therefore quite usual in imbecility. But it can also be found in persons who are not really stupid, but who do not wish *to be taken as stupid*. Thus a young student from whom associations were taken by an older intelligent woman student reacted altogether with definitions. The test person was of the opinion that it was an examination in intelligence, and therefore directed most of his attention to the significance of the stimulus words; his associations, therefore, looked like those of an idiot. Not all idiots, however, react with definitions; probably only those so react who would like to appear smarter than they are, that is, those to whom their stupidity is painful. I designate this widespread complex as "intelligence-complex." A normal test person reacts in a most overdrawn manner as follows:

anxiety—heart anguish;
to kiss—love's unfolding;
to kiss—perception of friendship.

This type gives a constrained and unnatural impression. The test persons wish to be more than they are, they wish to

exert more influence than they really have. Hence we see that persons with an intelligence complex are usually not natural and unconstrained; that they are always somewhat unnatural and flowery; they show a predilection for complicated foreign words, high sounding quotations, and other intellectual ornaments. In this way they wish to influence their fellow beings, they wish to impress others with their apparent education and intelligence, and thus to compensate for the painful feeling of stupidity. The definition type is closely related to the predicate type, or to express it more precisely, to the predicate type expressing personal judgment (*Wertprädikativtypus*). For example: flower—pretty;
 money—convenient;
 animal—ugly;
 knife—dangerous;
 death—ghastly.

In the definition type the intellectual significance of the stimulus word is rendered prominent, while in the predicate type it is its *emotional significance*. There are predicate types which are altogether overdrawn where there appear reactions like the following:

piano—horrible;
 to sing—heavenly;
 mother—ardently loved;
 father—something good, nice, holy.

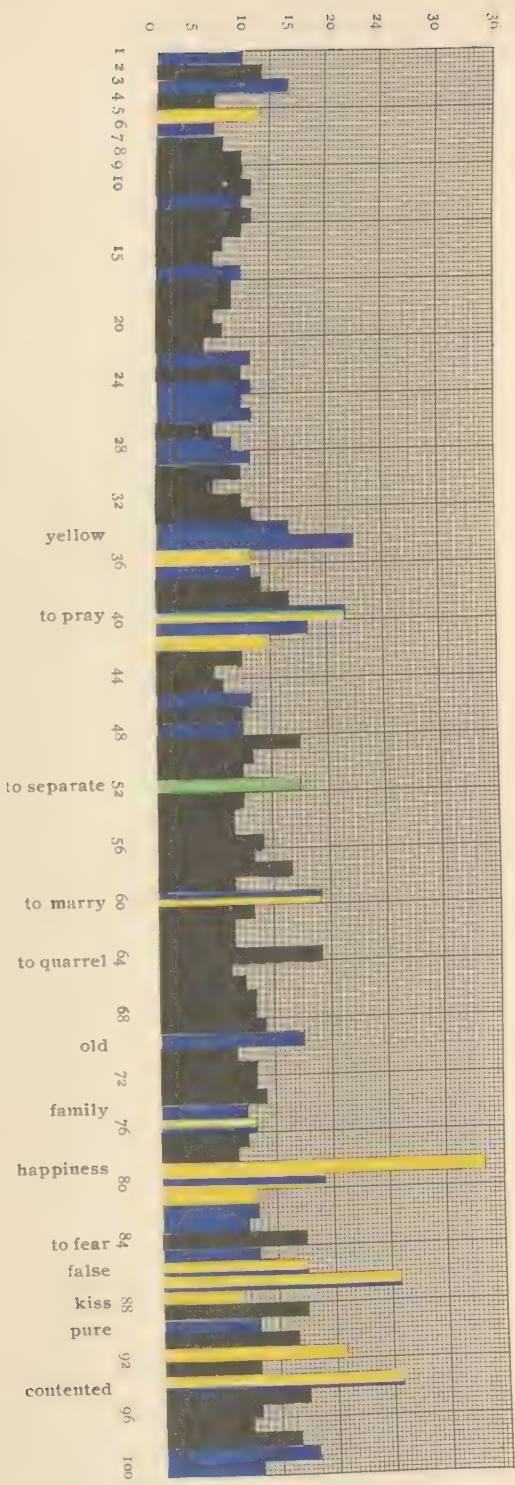
In the definition type an absolute *intellectual* make-up is manifested or rather simulated, but here there is a very *emotional* one. Yet, just as the definition type really conceals a lack of intelligence so the excessive *emotional* expression conceals or overcompensates an emotional deficiency. This conclusion is very interestingly illustrated by the following discovery:—On investigating the influence of the familiar milieus on the association type it was found that young individuals seldom possess a predicate type, but that on the other hand, the predicate type increases in frequency with the advancing age. In women the increase of the predicate type begins a little after the 40th year, and in men after the 60th. That is the precise time when, owing to the deficiency of sexuality, there actually occurs considerable emotional loss. If a test person evinces a distinct predicate type it may always be inferred that a marked internal emotional deficiency is thereby compensated. Still one cannot reason conversely, namely that an inner emotional deficiency must produce a predicate type, no more than that idiocy directly produces a definition type. A predicate type can also betray itself through the external behavior, as, for example, through a particular affectation, enthusiastic exclamations, an embellished behavior, and the constrained sounding language so often observed in society.

The complex type shows no particular tendency except the *concealment* of a complex, whereas the definition and predicate types betray a positive tendency to exert in some way a *definite* influence on the experimenter. But whereas the definition type tends to bring to light its intelligence, the predicate type displays its emotion. I need hardly add of what importance such determinations are for the diagnosis of character.

After finishing an association experiment I usually add another experiment of a different kind, the so-called *reproduction*. I repeat the same stimulus words and ask the test persons whether they still remember their former reactions. In many instances the memory fails, and as experience shows, these locations are stimulus words which touched an emotionally accentuated complex, or stimulus words immediately following such critical words.

This phenomenon has been designated as paradoxical and contrary to all experience. For it is known that emotionally accentuated things are better retained in memory than indifferent things. This is quite true, but it does not hold for the *linguistic* expression of an emotionally accentuated content. On the contrary one very easily forgets what he has said under emotion, one is even apt to contradict himself about it. Indeed the efficacy of cross-examinations in court depends on this fact. The reproduction method therefore serves to render still more prominent the complex stimulus. In normal persons we usually find a limited number of false reproductions, seldom more than 10-20%, while in abnormal persons, especially in hysterics, we often find from 20-40% of false reproductions. The reproduction certainty is therefore in certain cases a measure for the emotivity of the test person.

By far the larger number of neurotics show a pronounced tendency to cover up their intimate affairs in impenetrable darkness, even from the doctor, so that the doctor finds it very difficult to form a proper picture of the patient's psychology. In such cases I am greatly assisted by the association experiment. When the experiment is finished I first look over the general course of the reaction times. I see a great many very prolonged times which in itself means that the patient can only adjust himself with difficulty, that his psychological functions proceed with marked internal frictions, with *resistances*. By far the greater number of neurotics react only under great and hence very distinct resistances, there are, however, cases in which the average reaction times are as short as in the normal and in whom the other complex indicators are lacking, but who, despite that fact, undoubtedly present neurotic symptoms. These rare cases are especially found among very intelligent



For the stimulus words corresponding to the numbers see the formulary on the first and second pages of Lecture I.

and educated chronic patients who after many years of practice have learned to control their outward behavior and therefore outwardly display very little if anything of their neuroses. On superficial observation they can be taken as normal, yet in some places they show disturbances which betray the repressed complex.

After examining the reaction times I turn my attention to the type of the association to ascertain with what type I am dealing. If it is a predicate type I draw the conclusions which I have detailed above; if it is a complex type I try to ascertain the nature of the complex. With the necessary experience one can readily emancipate himself from the test person's statements and almost without any previous knowledge of the test persons it is possible under certain circumstances to read the most intimate complexes from the results of the experiment. I at first look for the reproduction words and put them together, and I then look for the stimulus words which show the greatest disturbances. In many cases a mere assortment of these words suffices to show the complex. In some cases it is necessary to put a question here and there. It will be best to illustrate this with a concrete example:

It concerns an educated woman of 30 years who has been married for three years. After her marriage she suffers from episodic excitements in which she is violently jealous of her husband. The marriage is a happy one in every other respect and it should be noted that the husband gives no cause for the jealousy. The patient is sure that she loves him and that her excited states are groundless. She cannot imagine whence these excited states originate, and feels quite perplexed over them. It is to be noted that the patient is a catholic and has been brought up religiously, while her husband is a protestant. This difference of religion did not admittedly play any part. A more thorough anamnesis showed the existence of an extreme prudishness. Thus, for example, no one was allowed to talk in the patient's presence about her sister's childbirth, because the sexual moment suggested therein caused her the greatest excitement. She always undressed in the adjoining room and never in her husband's presence, etc. At the age of 27 she was supposed to have had no idea how children were born. The associations gave the results shown in the accompanying chart.

The blue columns represent failures of reproductions, the green ones represent repetitions of stimulus words, and the yellow columns show those associations in which the patient either laughed or made mistakes, using many instead of one word. The height of the columns represent the length of the reaction time.

The stimulus words characterized by marked disturbances are the following: yellow, to pray, to separate, to marry, to quarrel, old, family, happiness, false, fear, to kiss, bride, to choose, contented. The strongest disturbances are found in the following stimulus words: *to pray, to marry, happiness, false, fear, and contented*. These words, therefore, seemingly strike the complex above all. The conclusion that can be drawn from this is that she is not indifferent to the fact that her husband is a protestant, for she again thinks of praying, that there is something wrong with marriage, that she is false, that is, she entertains fancies of faithlessness, she is afraid (of the husband? of the future?), she is not contented with her choice (to choose) and she thinks of separation. The patient therefore has a separation complex for she is very discontented with her married life. When I told her this result she was affected and at first attempted to deny it, then to mince over it, but finally she admitted everything I said and added still more. She reproduced a large number of fancies of faithlessness, reproaches against her husband, etc. *Her prudishness and jealousy were merely a projection of her own sexual wishes on her husband*. Because she was faithless in her fancies and did not admit it to herself she was jealous of her husband.

It is impossible in a lecture to give a review of all the possible uses of the association experiment. I must consent myself with having demonstrated to you at least some of its chief uses.

LECTURE II

THE FAMILIAR CONSTELLATIONS

Ladies and Gentlemen: As you have seen, there are manifold ways in which the association experiment may be employed in practical psychology. I should like to speak to you to-day about another utilization of this experiment which is primarily of only theoretical significance. My pupil, Miss Fürst, M. D., has made the following research: she has applied the association experiment to 24 families, consisting altogether of 100 test persons; the resulting material amounted to 2,200 associations. This material was elaborated in the following manner: Fifteen separate groups were formed according to logical-linguistic standards, and the associations were arranged as follows:

	Husband	Wife	Difference
I. Co-ordination	6.5	0.5	6
II. Sub and supraordination	7	—	7
III. Contrast	—	—	—
IV. Predicate expressing a personal judgment	8.5	95.	86.5
V. Simple predicate	21.	3.5	17.5

	Husband	Wife	Difference
VI. Relations of the verb to the subject or complement	15.5	0.5	15.
VII. Designation of time, etc.	11.	-	11.
VIII. Definition	11.	-	11.
IX. Coexistence	1.5	-	1.5
X. Identity	0.5	0.5	-
XI. Motor-speech combination	12.	-	12
XII. Composition of words	-	-	-
XIII. Completion of words	-	-	-
XIV. Clang associations	-	-	-
XV. Defective reactions	-	-	-
Total,	-	-	173.5
	173.5		
Average difference	15		= 11.5

As can be seen from this example, I utilize the difference to show the degree of the analogy. In order to find a base for the total resemblance I have calculated the differences among all of Miss Fürst's test persons not related among themselves by comparing every female test person with all the other unrelated females; the same has been done for the male test persons.

The most marked difference is found in those cases where the two test persons compared have no associative quality in common. All the groups are calculated in percentages, the greatest difference possible being $\frac{200}{15} = 13.3\%$.

I. The average difference of male unrelated test persons is 5.9%, and that of females of the same group is 6%.

II. The average difference between male related test persons is 4.1%, and that between female related test persons is 3.8%. From these numbers we see that relatives show a tendency to agreement in the reaction type.

III. Difference between fathers and children = 4.2.

" " mothers " " = 3.5.

The reaction types of children come nearer to the type of the mother than to the father.

IV. Difference between fathers and their sons = 3.1.

" " " " " daughters = 4.9.

" " mothers " " sons = 4.7.

" " " " " daughters = 3.0.

V. Difference between brothers = 4.7.

" " sisters = 5.1.

If the married sisters are omitted from the comparison we get the following result:

Difference of unmarried sisters = 3.8.

These observations show distinctly that marriage destroys more or less the original agreement, as the husband belongs to a different type.

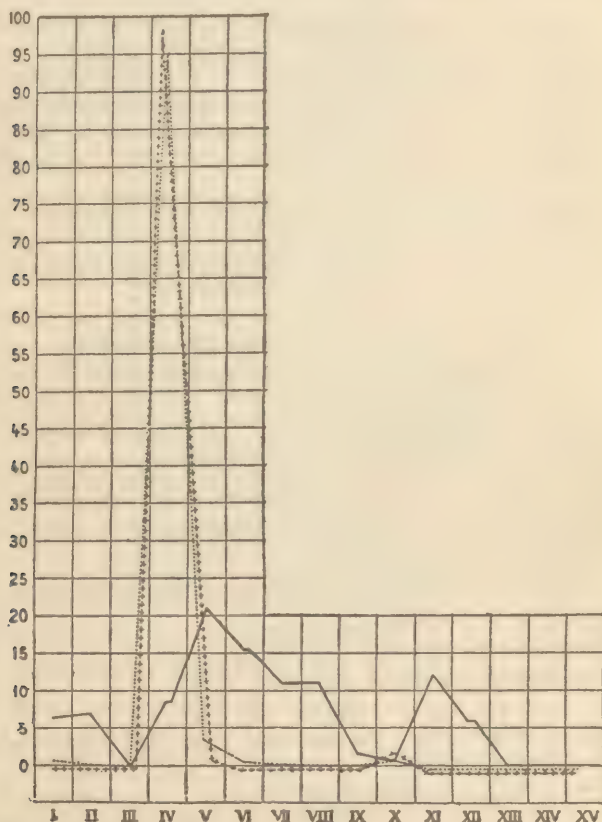
The difference between unmarried brothers = 4.8.

Marriage seems to exert no influence on the association forms in man. Nevertheless, the material which we have at our disposal is not as yet enough to allow us to draw definite conclusions.

VI. The difference between husband and wife = 4.7. This number, however, sums up very inadequately the different values; that is, there are some cases which show a marked difference and some which show a marked agreement.

The description in curves of the different results follows.

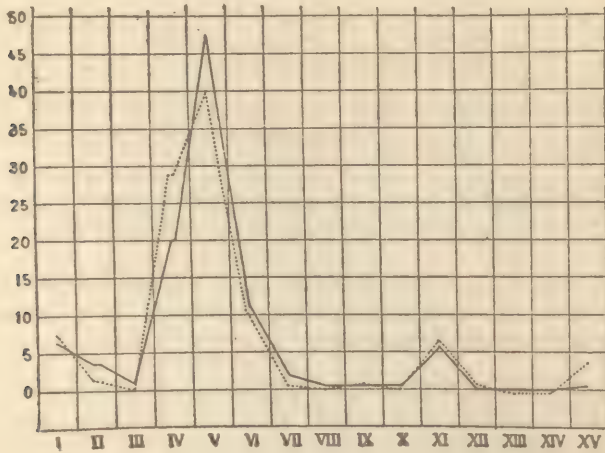
In the curves here reproduced I have marked above the number of associations of each quality in percentages. The Roman letters written below the diagram designate the forms of association indicated in the above tables (see above).



Curve A. — father; mother; ++++ daughter.

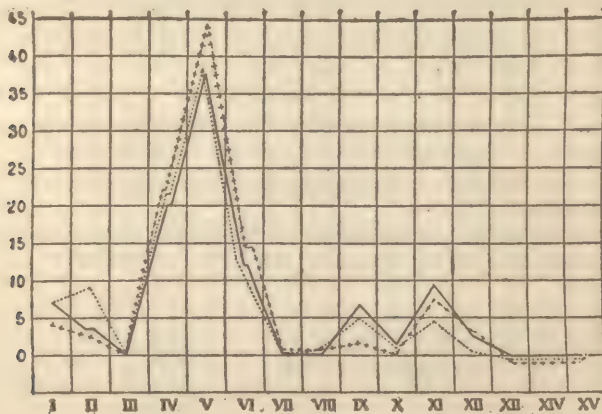
I. Assoc. by co-ordination; II. sub and supraordination; III. contrast, etc. (See above table.)

Curve A. The father (continued line) shows an objective type, while the mother and daughter show the pure predicate type with a pronounced subjective tendency.



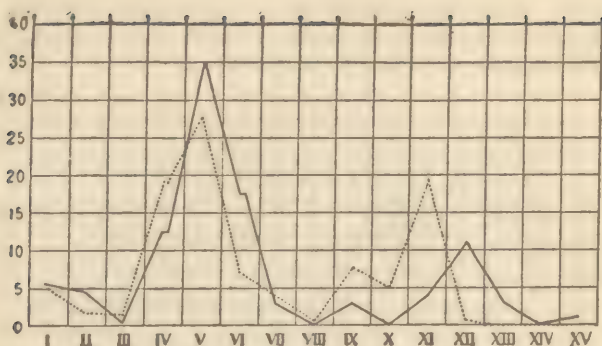
Curve B. — husband; wife.

Curve B. The husband and wife agree well in the predicate objective type, the predicate subjective being somewhat more numerous in the wife.



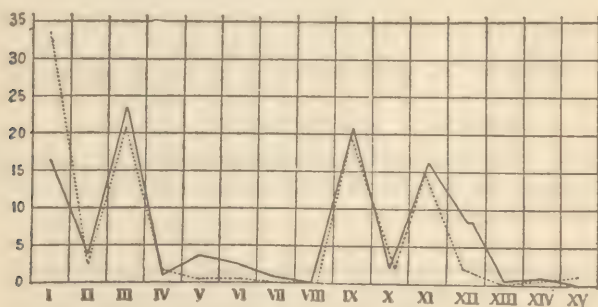
Curve C. — father; 1st daughter; ++++ 2nd daughter.

Curve C. A very nice agreement between a father and his two daughters.



Curve D. — single sister; married sister.

Curve D. Two sisters living together. The dotted line represents the married sister.



Curve E. — husband; wife.

Curve E. Husband and wife. The wife is a sister of the two women of curve D. She approaches very closely to the type of her husband. Her curve is the direct opposite of that of her sisters.

The similarity of the associations is often very extraordinary. I will reproduce here the associations of a mother and her daughter.

Stimulus Word	Mother	Daughter
to pay attention	diligent pupil	pupil
law	command of God	Moses
dear	child	father and mother
great	God	father
potato	bulbous root	bulbous root
family	many persons	5 persons
strange	traveller	traveller
brother	dear to me	dear
to kiss	mother	mother

Stimulus word	Mother	Daughter
burn	great pain	painful
door	wide	big
hay	dry	dry
month	many days	31 days
air	cool	moist
coal	sooty	black
fruit	sweet	sweet
merry	happy child	child

One might indeed think that in this experiment, where full scope is given to chance, individuality would become a factor of the utmost importance, and that therefore one might expect a very great diversity and lawlessness of associations. But as we see the opposite is the case. Thus the daughter lives contently in the same circle of ideas as her mother, not only in her thought but in her form of expression; indeed, she even uses the same words. What seems more flighty, more inconstant, and more lawless than a fancy, a rapidly passing thought? It is not, however, lawless, and not free, but closely determined within the limits of the milieu. If, therefore, even the superficial and manifestly most flighty formations of the intellect are altogether subject to the milieu-constellation, what should we expect for the more important conditions of the mind, for the emotions, wishes, hopes, and intentions? Let us consider a concrete example,—the curve A. (See above.)

The mother is 45 years old and the daughter 16 years. Both have a very distinct predicate type expressing personal judgment, and differ from the father in the most striking manner. The father is a drunkard and a demoralized creature. We can thus readily understand that his wife perceives an emotional voidness which she naturally betrays by her enhanced predicate type. The same causes cannot, however, operate in the daughter, for in the first place she is not married to a drunkard, and secondly life with all its hopes still lies before her. It is distinctly unnatural for the daughter to show an extreme predicate type expressing personal judgment. She responds to the stimuli of the environment just like her mother. But whereas in the mother the formation is in a way a natural consequence of her unhappy condition of life, this condition is entirely lacking in the daughter. The daughter simply imitates the mother; she merely appears like the mother. Let us consider what this can signify for a young girl. If a young girl reacts to the world like an old woman disappointed in life this at once shows unnaturalness and constraint. But more serious consequences are possible. As you know the predicate type is a manifestation of intensive emotions; emotions are always involved. Thus we cannot prevent ourselves from answering at least inwardly to the feelings and passions of our

nearest environment; we allow ourselves to be infected and carried away by it. Originally the affects and their physical manifestations had a biological significance; *i. e.*, they were a protective mechanism for the individual and the whole herd. If we manifest emotions we can with certainty expect to receive emotions in return. That is the sense of the predicate type. What the 45-year-old woman lacks in emotions; *i. e.*, in love in her marriage relations she seeks to obtain from the outside, and it is for that reason that she is an ardent participant in the Christian Science meetings. If the daughter imitates this situation she does the same thing as her mother, she seeks to obtain emotions from the outside. But for a girl of 16 such an emotional state is to say the least quite dangerous; like her mother she reacts to her environment as a sufferer soliciting sympathy. Such an emotional state is no longer dangerous in the mother, but for obvious reasons it is quite dangerous in the daughter. Once freed from her father and mother she will be like her mother; *i. e.*, she will be a suffering woman craving for inner gratification. She will thus be exposed to the greatest danger of falling a victim to brutality and of marrying a brute and inebriate like her father.

This consideration seems to me to be of importance for the conception of the influence of environment and education. The example shows what passes over from the mother to the child. It is not the good and pious precepts, nor is it any other inculcation of pedagogic truths that have a moulding influence upon the character of the developing child, but what most influences him is the peculiarly affective state which is totally unknown to his parents and educators. The concealed discord between the parents, the secret worry, the repressed hidden wishes, all these produce in the individual a certain affective state with its objective signs which slowly but surely, though unconsciously, works its way into the child's mind, producing therein the same conditions and hence the same reactions to external stimuli. We know that association with mournful and melancholic persons will depress us, too. A restless and nervous individual infects his surroundings with unrest and dissatisfaction, a grumbler, with his discontent, etc. If grown-up persons are so sensitive to such surrounding influences we certainly ought to expect more of this in the child whose mind is as soft and plastic as wax. The father and mother impress deeply into the child's mind the seal of their personality, the more sensitive and mouldable the child the deeper is the impression. Thus even things that are never spoken about are reflected in the child. The child imitates the gesture, and just as the gesture of the parent is the expression of an emotional state, so in turn the gesture gradually produces in the child a

similar feeling, as it feels itself, so to speak, into the gesture. Just as the parents adapt themselves to the world so does the child. At the age of puberty when it begins to free itself from the spell of the family, it enters into life with so to say a surface of fracture entirely in keeping with that of the father and mother. The frequent and often very deep *depressions of puberty* emanate from this; they are symptoms which are rooted in the difficulty of new adjustment. The youthful person at first tries to separate himself as much as possible from his family, he may even estrange himself from it, but inwardly this only ties him the more firmly to the parental image. I recall the case of a young neurotic who ran away from his parents, he was strange and almost hostile to them, but he admitted to me that he possessed a special sanctum; it was a strong box containing his old childhood books, old dried flowers, stones, and even small bottles of water from the well at his home and from a river along which he walked with his parents, etc.

The first attempts to assume friendship and love are constellated in the strongest manner possible by the relation to parents, and here one can usually observe how powerful are the influences of the familiar constellations. It is not rare, *e. g.*, for a healthy man whose mother was hysterical to marry a hysterical, or for the daughter of an alcoholic to choose an alcoholic for her husband. I was once consulted by an intelligent and educated young woman of 26 who suffered from a peculiar symptom. She thought that her eyes now and then took on a strange expression which exerted a disagreeable influence on men. If she then looked at a gentleman he became embarrassed, turned away and said something rapidly to his neighbor, at which both were either embarrassed or inclined to laugh. The patient was convinced that her look excited indecent thoughts in the men. It was impossible to convince her of the falsity of her conviction. This symptom immediately aroused in me the suspicion that I dealt with a case of paranoia rather than with a neurosis. But as was shown only three days later by the further course of the treatment, I was mistaken, for the symptom promptly disappeared after it had been explained by analysis. It originated in the following manner: The lady had a lover who deserted her in a very striking manner. She felt utterly forsaken, she withdrew from all society and pleasure, and entertained suicidal ideas. In her seclusion there accumulated unadmitted and repressed erotic wishes which she unconsciously projected on men whenever she was in their company. This gave rise to her conviction that her look excited erotic wishes in men. Further investigation showed that her deserting lover was alunatic, which she did not apparently observe. I expressed my surprise at her unsuitable choice and added

that she must have had a certain predilection for loving mentally abnormal persons. This she denied, stating that she had once before been engaged to be married to a normal man. He, too, deserted her; and on further investigation it was found that he, too, had been in an insane asylum shortly before,—another lunatic! This seemed to me to confirm with sufficient certainty my belief that she had an unconscious tendency to choose insane persons. Whence originated this strange taste? Her father was an eccentric character, and in later years entirely estranged from his family. Her whole love had therefore been turned away from her father to a brother 8 years her senior; him she loved and honored as a father, and this brother became hopelessly insane at the age of 14. That was apparently the model from which the patient could never free herself, after which she chose her lovers, and through which she had to become unhappy. Her neurosis which gave the impression of insanity probably originated from this infantile model. We must take into consideration that we are dealing in this case with a highly educated and intelligent lady who did not pass carelessly over her mental experiences, who indeed reflected much over her unhappiness without, however, having any idea whence her misfortune originated.

These are things which inwardly appeal to us as matter of course, and it is for this reason that we do not see them but attribute everything to the so-called congenital character. I could cite any number of examples of this kind. Every patient furnishes contributions to this subject of the determination of destiny through the influence of the familiar milieus. In every neurotic we see how the constellation of the infantile milieu influences not only the character of the neurosis but also life's destiny, in its very details. Numberless unhappy choices of profession and matrimonial failures can be traced to this constellation. There are, however, cases where the profession has been happily chosen, where the husband or wife leaves nothing to be desired, and where still the person does not feel well but works and lives under constant difficulties. Such cases often appear in the guise of chronic neurasthenia. Here the difficulty is due to the fact that the mind is unconsciously split into two parts of divergent tendencies which are impeding each other; one part lives with the husband or with the profession, while the other lives unconsciously in the past with the father or mother. I have treated a lady who, after suffering many years from a severe neurosis, merged into a dementia præcox. The neurotic affection began with her marriage. This lady's husband was kind, educated, well to do, and in every respect suitable for her; his character showed nothing that would in any way in-

terfere with a happy marriage. Despite that the marriage was an unhappy one merely because the wife was neurotic and therefore prevented all congenial companionship.

The important heuristic axiom of every psychanalysis reads as follows: *If a neurosis springs up in a person this neurosis contains the counter-argument against the relationship of the patient to the personality with which he is most intimately connected.* If the husband has a neurosis the neurosis thus loudly proclaims that he has intensive resistances and contrary tendencies against his wife, and if the wife has a neurosis the wife has a tendency which diverges from her husband. If the person is unmarried the neurosis is then directed against the lover or the sweetheart or against the parents. Every neurotic naturally strives against this relentless formulation of the content of his neurosis, and he often refuses to recognize it at any cost, but still it is always justified. To be sure the conflict is not on the surface but must generally be revealed through a painstaking psychanalysis.

The history of our patient reads as follows:

The father had a powerful personality. She was his favorite daughter and entertained for him a boundless veneration. At the age of 17 she for the first time fell in love with a young man. At that time she had twice the same dream, the impression of which never left her in all her later years; she even imputed to it a mystic significance and often recalled it with religious dread. In the dream she saw a tall, masculine figure with a very beautiful white beard; at this sight she was permeated with a feeling of awe and delight as if she experienced the presence of God himself. This dream made the deepest impression on her, and she was constrained to think of it again and again. The love affair of that period proved to be one of little warmth and was soon given up. Later the patient married her present husband. Though she loved her husband she was led continually to compare him with her deceased father; this comparison always proved unfavorable to her husband. Whatever the husband said, intended, or did, was subjected to this standard and always with the same result: "My father would have done all this better and differently." Our patient's life with her husband was not happy, she could neither respect nor love him sufficiently; she was inwardly dissatisfied and unsatiated. She gradually evinced a fervent piety, and at the same time there appeared a violent hysterical affection. She began by going into raptures now over this and now over that clergyman, she was looking everywhere for a spiritual friend, and estranged herself more and more from her husband. The mental trouble made itself manifest after about a decade. In her diseased state she refused to have

anything to do with her husband and child; she imagined herself pregnant by another man. In brief, the resistances against her husband which hitherto had been laboriously repressed came out quite openly, and among other things manifested themselves in insults of the gravest kind directed against her husband.

In this case we see how a neurosis appeared, as it were at the moment of marriage, *i. e.*, *this neurosis expresses the counter-argument against the husband*. What is the counter-argument? The counter-argument is the father of the patient, for she verified daily her belief that her husband was not equal to her father. When the patient first fell in love there also appeared a symptom in the form of a very impressive visionary dream. She saw the man with the very beautiful white beard. Who was this man? On directing her attention to the beautiful white beard she immediately recognized the phantom. It was of course her father. Thus every time the patient merged into a love affair the picture of the father inopportunely appeared and prevented her from adjusting herself psychologically to her husband.

I purposely chose this case as an illustration because it is simple, obvious, and quite typical of many marriages which are crippled through the neurosis of the wife. The unhappiness always lies in a too firm attachment to the parents. The offspring remains in the infantile relations. We can find here one of the most important tasks of pedagogy, namely, the solution of the problem how to free the growing individual from his unconscious attachments to the influences of the infantile milieu, in such a manner that he may retain whatever there is in it that is suitable and reject whatever is unsuitable. To solve this difficult question on the part of the child seems to me impossible at present. We know as yet too little about the child's emotional processes. The first and only real contribution to the literature on this subject has in fact appeared during the present year. It is the analysis of a five-year-old boy published by Freud.

The difficulties on the part of the child are very great. They should not, however, be so great on the part of the parents. In many ways the parents could manage more carefully and more indulgently the love of children. The sins committed against favorite children by the undue love of the parents could perhaps be avoided through a wider knowledge of the child's mind. For many reasons I find it impossible to tell you anything of general validity concerning the bringing up of children as it is affected by this problem. We are as yet very far from general prescriptions and rules; are still in the realm of casuistry. Unfortunately our knowledge of the finer

mental processes in the child is so meagre that we are after all not in any position to say where the greater trouble lies, whether in the parents, in the child, or in the conception of the milieu. Only psychanalyses of the kind that Professor Freud has published in our *Jahrbuch*, 1909, will help us out of this difficulty. Such comprehensive and profound observations should act as a strong inducement to all teachers to occupy themselves with Freud's psychology. This psychology offers more for practical pedagogy than the physiological psychology of the present.

LECTURE III

EXPERIENCES CONCERNING THE PSYCHIC LIFE OF THE CHILD

Ladies and Gentlemen: In the last lecture we have seen how important for later life are the emotional processes of childhood. In to-day's lecture I should like to give you some insight into the psychic life of the child through the analysis of a 4-year-old girl. It is much to be regretted that there are doubtless few among you who have had opportunity to read the analysis of "Little John" (*Kleiner Hans*), which has been published by Freud during the current year.¹ I should properly begin by giving you the content of that analysis, so that you might be in a position to compare for yourselves the results of Freud with those obtained by me, and to observe the marked, even astonishing, similarity between the unconscious creations of the two children. Without a knowledge of the fundamental analysis of Freud, much in the report of the following case will appear to you strange, incomprehensible, and perhaps unacceptable. I beg you, however, to defer final judgment and to enter upon the consideration of these new subjects with a kindly disposition, for such pioneer work in virgin soil requires not only the greatest patience on the part of the investigator, but also the unprejudiced attention of his audience. Because the Freudian investigations apparently involve an indelicate discussion of the most intimate secrets of sexuality many people have had a feeling of repulsion and have therefore rejected everything as a matter of course without any real proof. This, unfortunately, has almost always been the fate of Freud's doctrines until now. One must not come to the consideration of these matters with the firm conviction that they do not exist, else it may easily come to pass that for the prejudiced they really do not exist. One should perhaps for the moment assume the author's point of view and investigate these phenomena under his guidance. In this way only can

¹Jahrbuch f. Psychoanalytische und Psychopathologische Forschungen, Band I, Denticke, Wien.

the correctness or incorrectness of our observations be affirmed. We may err, as all human beings err. But the continual holding up to us of our mistakes,—perhaps they are worse than mistakes,—does not help us to see things more distinctly. We should prefer to see *wherein* we err. That should be shown to us in our own sphere of experience. Thus far, however, no one has succeeded in meeting us on our own ground, and in giving us a different conception of the things which we ourselves see. We must still complain that our critics are persisting in complete ignorance and without the slightest notion about the matters in question. The only reason for this is that our critics have never taken the trouble to become thoroughly acquainted with our method; had they done this they would have understood us.

The little girl to whose sagacity and intellectual vivacity we are indebted for the following observations is a healthy, lively child of emotional temperament. She has never been seriously ill, and never, even in the realm of the nervous system, had there been observed any symptoms prior to this investigation. In the report which will now follow we shall have to waive a connected description, for it is made up of anecdotes which treat of one out of a whole cycle of similar experiences, and which cannot, therefore, be arranged scientifically and systematically, but must rather be described somewhat in the form of a story. This manner of description we cannot as yet dispense with in our analytic psychology, for we are still far from being able in all cases to separate with unerring certainty the curious from the typical.

When the little daughter, whom we will call Anna, was about 3 years old, she once had the following conversation with her grandmother:

Anna: "Grandma, why have you such withered eyes?"

Grandma: "Because I am old?"

A. "But you will become young again."

G. "No, do you know, I shall become older and older, and then I shall die."

A. "Well, and then?"

G. "Then I shall become an angel."

A. "And then will you again become a little child?"

The child found here a welcome opportunity for the provisional solution of a problem. For some time before she had been in the habit of asking her mother whether she would ever have a living doll, a little child, a little brother. This naturally included the question as to the origin of children. As such questions appeared only spontaneously and indirectly, the parents attached no significance to them, but received

them as lightly and in appearance as facetiously as the child seemed to ask them. Thus she once received from her father the amusing information that children are brought by the stork. Anna had already heard somewhere a more serious version, namely, that children are little angels living in heaven and are brought from heaven by the stork. This theory seems to have become the starting point for the investigating activity of the little one. From the conversation with the grandmother it could be seen that this theory was capable of wide application, namely, it not only solved in a comforting manner the painful idea of parting and dying, but at the same time it solved satisfactorily the riddle of the origin of children. Such solutions which kill at least two birds with one stone were formerly tenaciously adhered to in science, and even in the child they cannot be made retrograde without some shock.

Just as was the birth of a little sister the turning point in the history of "little John," so it was in this case the birth of a brother, which happened when Anna had reached the age of 4 years. The pregnancy of the mother apparently remained unnoticed; *i. e.*, the child never expressed herself on this subject. On the evening before the childbirth when the labor pains began to manifest themselves in the mother, the child was in her father's room. He took her on his knee and said, "Tell me, what would you say if you should get a little brother to-night?" "I would kill it," was the prompt answer. The expression "to kill" looks very serious, but in reality it is quite harmless, for "to kill" and "to die" in child language signify only to remove either in the active or in the passive sense, as has already been pointed out a number of times by Freud. "To kill" as used by the child is a harmless word, especially so when we know that the child uses the word "kill" quite promiscuously for all possible kinds of destruction, removal, demolition, etc. It is, nevertheless, worth while to note this tendency (see the analysis of *Kleiner Hans*, p. 5).

The childbirth occurred early in the morning in the presence of a physician and a midwife. When all remnants of the birth, including some blood traces, were cleaned up, the father entered the room where the little one slept. She awoke as he entered. He imparted to her the news of the advent of a little brother which she took with surprise and strained facial expression. The father took her in his arms and carried her into the confinement chamber. She first threw a rapid glance at her somewhat pale mother and then displayed something like a mixture of despair and suspicion as if thinking, "Now what else is going to happen? (Father's impression.) She displayed hardly any pleasure at the sight of the new arrival, so that the cool reception she gave it caused general disappointment.

During the forenoon she kept very noticeably away from her mother; this was the more striking as she was usually much attached to her mother. But once when her mother was alone she ran into the room, embraced her and said, "Well, aren't you going to die now?" This explains a part of the conflict in the child's psyche. Though the stork theory was never really taken seriously, she accepted the fruitful re-birth hypothesis, according to which a person by dying assisted a child into life. Accordingly the mother, too, must die; why, then, should the newborn child, against whom she already felt childish jealousy, cause her pleasure? It was for this reason that she had to ascertain in a favorable moment whether the mother was to die, or rather was moved to express the hope that she would not die.

With this happy issue, however, the re-birth theory sustained a severe shock. How was it possible now to explain the birth of her little brother and the origin of children in general? There still remained the stork theory which, though never expressly rejected, had been implicitly waived through the assumption of the re-birth theory. The explanations next attempted unfortunately remained hidden from the parents as the child stayed a few weeks with her grandmother. From the grandmother's report we learned that the stork theory was often discussed, and it was naturally re-enforced by the concurrence of those about her.

When Anna returned to her parents she again on meeting her mother evinced the same mixture of despair and suspicion which she had displayed after the birth. The impression, though inexplicable, was quite unmistakable to both parents. Her behavior towards the baby was very nice. During her absence a nurse had come into the house who, on account of her uniform made a deep impression on Anna; to be sure, the impression at first was quite unfavorable as she evinced the greatest hostility to her. Thus nothing could induce her to allow herself to be undressed and put to sleep by this nurse. Whence this resistance originated was soon shown in an angry scene near the cradle of the little brother in which Anna shouted at the nurse, "This is not your little brother, it is mine!" Gradually, however, she became reconciled to the nurse and began to play nurse herself, she had to have her white cap and apron and "nursed" now her little brother and now her doll.

In contrast to her former mood she became unmistakably mournful and dreamy. She often sat for a long time under the table singing and rhyming stories which were partially incomprehensible but sometimes contained the "nurse" theme ("I am a nurse of the green cross"). Some of the stories, how-

ever, distinctly showed a painful feeling striving for expression.

Here we meet with a new and important feature in the little one's life, that is, we meet with reveries, tendencies towards the composition of poetry, and melancholic attacks. All these things which we are wont first to encounter at a later period of life, at a time when the youthful person is preparing to sever the family tie and to enter independently upon life, but is still held back by an inward, painful feeling of homesickness and the warmth of the parental hearth. At that time the youth begins to replace his longing with poetic fancies in order to compensate for the deficiency. To approximate the psychology of a four-year-old child to that of the age of puberty will at first sight seem paradoxical, the relationship lies, however, not in the age but rather in the mechanism. The elegiac reveries express the fact that a part of that love which formerly belonged and should belong to a real object is now *introverted*, that is, it is turned inward into the subject and there produces an increased imaginative activity. What is the origin of this *introversion*? Is it a psychological manifestation peculiar to this age, or does it owe its origin to a conflict?

This is explained in the following occurrence. It often happened that Anna was disobedient to her mother, she was insolent, saying, "I am going back to grandma."

Mother: "But I shall be sad when you leave me."

Anna: "Oh, but you have the little brother."

The effect which this produced on the mother shows what the little one was really aiming at with her threats to go away again; she apparently wished to hear what her mother would say to her proposal, that is, to see what attitude her mother would actually assume to her, whether her little brother had not crowded her out altogether from her mother's favor. One must, however, give no credence to this little trickster. For the child could readily see and feel that despite the existence of the little brother there was nothing essentially lacking for her in her mother's love. The reproach to which she subjects her mother is therefore unjustified and to the trained ear this is betrayed by a slightly affected tone. Such a tone is unmistakable, shows that it does not expect to be taken seriously and hence it obtrudes itself re-enforced. The reproach as such must also not have been taken seriously by the mother for it was only the forerunner of other and this time more serious resistances. Not long after the previously reported conversation the following scene took place:

Mother: "Come, we are going into the garden now!"

Anna: "You are lying, take care if you are not telling the truth."

M. "What are you thinking of? I always tell the truth."

A. "No, you are not telling the truth."

M. "You will soon see that I am telling the truth; we are going into the garden now."

A. "Indeed, is that true? Is that really true? Are you not lying?"

Scenes of this kind were repeated a number of times. This time the tone was more rude and more penetrating, and at the same time the accent on the word "lie" betrayed something special which the parents did not understand; indeed, at first they attributed too little significance to the spontaneous utterances of the child. In this they merely did what education usually does with official sanction. One usually pays little heed to children in every stage of life; in all essential matters, they are treated as not responsible, and in all unessential matters, they are trained with an automatic precision.

Under resistances there always lies a question, a conflict, of which we hear at later times and on other occasions. But usually one forgets to connect the thing heard with the resistances. Thus, on another occasion Anna put to her mother the following difficult questions:

Anna: "I should like to become a nurse when I grow big, —why did you not become a nurse?"

Mother: "Why, as I have become a mother I have children to nurse anyway."

A. (Reflecting) "Indeed, shall I be a different woman from you, and shall I still speak to you?"

The mother's answer again shows whither the child's question was really directed. Apparently Anna, too, would like to have a child to "nurse" just as the nurse has. Where the nurse got the little child is quite clear. Anna, too, could get a child in the same way if she were big. Why did not the mother become such a plain nurse, that is to say, how did she get a child if not in the same way as the nurse? Like the nurse, Anna, too, could get a child, but how that fact might be changed in the future or how she might come to resemble her mother in respect to getting children is not clear to her. From this resulted the thoughtful question, "Indeed, shall I be a different woman from you? Shall I be different in every respect?" The stork theory evidently had come to naught, the dying theory met a similar fate; hence she now thinks one may get a child in the same way, as, for example, the nurse got hers. She, too, could get one in this natural way, but how about the mother who is no nurse and still has children? Looking at the matter at this point of view, Anna asks: "Why did you not become a nurse?" namely, "why have you not got your child in the natural way?" This peculiar indirect

manner of questioning is typical, and evidently corresponds with the child's hazy grasp of the problem, unless we assume a certain diplomatic uncertainty prompted by a desire to evade direct questioning. We shall later find an illustration of this possibility. Anna is evidently confronted with the question "where does the child come from?" The stork did not bring it; mother did not die; nor did mother get it in the same way as the nurse. She has, however, asked this question before and received the information from her father that the stork brings children; this is positively untrue, she can never be deceived on this point. Accordingly, papa and mama and all the others lie. This readily explains her suspicion at the childbirth and her discrediting of her mother. But it also explains another point, namely, the elegiac reveries which we have attributed to a partial introversion. We know now from what real object love had to be taken and introverted to no purpose, namely, it had to be taken *from the parents* who deceived her and refused to tell her the truth. (What must this be which cannot be uttered? What is going on here?) Such were the parenthetic questions of the child, and the answer was: Evidently this must be something to be concealed, perhaps something dangerous. Attempts to make her talk and to draw out the truth by means of (insidious) questions were futile, she exerted *resistance against resistance*, and the introversion of love began. It is evident that the capacity for sublimation in a 4-year-old child is still too slightly developed to be capable of performing more than symptomatic services. The mind, therefore, depends on another compensation, namely, it resorts to one of the relinquished infantile devices for securing love by force, the most preferred is that of crying and calling the mother at night. This has been diligently practised and exhausted during her first year. It now returns and corresponding to the period of life it has become well determined and equipped with recent impressions. It was just after the earthquakes in Messina, and this event was discussed at the table. Anna was extremely interested in everything, she repeatedly asked her grandma to relate to her how the earth shook, how the houses were demolished and many people lost their lives. After this she had nocturnal fears, she could not remain alone, her mother was forced to go to her and stay with her; otherwise she feared that an earthquake would appear, that the house would fall and kill her. During the day, too, she was much occupied with such thoughts. While walking with her mother she annoyed her with such questions as, "Will the house be standing when we return home? Are you sure there is no earthquake at home? Will papa still be living?" About every stone lying in the road she asked whether it was from an

earthquake. A new building was a house destroyed by the earthquake, etc. She finally even cried out frequently at night that the earthquake was coming and that she heard the thunder. In the evening she had to be solemnly assured that there was no earthquake coming.

Many means of calming her were tried, thus she was told, for example, that earthquakes only exist where there are volcanoes. But then she had to be satisfied that the mountains surrounding the city were not volcanoes. This reasoning gradually caused in the child an eager desire for learning, strong but quite unnatural for her age, which manifested itself in her requiring that all the geological atlases and text-books should be brought her from her father's library. For hours she rummaged through these works looking for pictures of volcanoes and earthquakes, and asking questions continually. We are here confronted by an energetic effort to sublimate the fear into an eager desire for learning, which at this age made a decidedly premature exaction; but, as in many a gifted child which suffers from precisely the same difficulty, many effects of this immature sublimation were surely not to her advantage. For, by favoring sublimation at this age one merely enforces a fragment of neurosis. The root of the eager desire for learning is the *fear* and the *fear is the expression of a converted libido*; that is, it is the expression of *an introversion which henceforth becomes neurotic*, which at this age is neither necessary nor favorable for the development of the child.

Whither this eager desire for learning was ultimately directed is explained by a series of questions which arose almost daily. "Why is Sophie (a younger sister) younger than I?" "Where was Freddy (the little brother) before? Was he in heaven? What was he doing there? Why did he come down just now, why not before?"

This state of affairs induced the father to decide that the mother should tell the child when occasion offered *the truth concerning the origin of the little brother*. This having been done Anna soon thereafter asked about the stork. Her mother told her that the story of the stork was not true, but that Freddy grew up in his mother like the flowers in a plant. At first he was very little, and then he became bigger and bigger just like a plant. She listened attentively without the slightest surprise, and then asked, "But did he come out all by himself?"

Mother: "Yes."

Anna: "But he cannot walk!"

Sophie: "Then he crawled out."

Anna, overhearing her little sister's answer,— "Is there a hole here? (pointing to the breast) or did he come out of the mouth? Who came out of the nurse?" She then interrupted

herself and exclaimed, "No, no, the stork brought little brother down from heaven." She soon left the subject and again wished to see pictures of volcanoes. During the evening following this conversation she was calm. The sudden explanation produced in the child a whole series of ideas, which manifested themselves in certain questions. Unexpected perspectives were opened; she rapidly approached the main problem, namely, the question, "*Where did the child come out?*" *Was it from a hole in the breast or from the mouth?* Both suppositions are entirely qualified to form acceptable theories. We even meet with recently married women who still entertain the theory of the hole in the abdominal wall or of the Cæsarean section; this is supposed to betray a very curious form of innocence. But as a matter of fact it is not innocence, as we are always dealing in such cases with infantile sexual activities, which in later life have brought the *vias naturales* into ill repute.

It may be asked where the child got the absurd idea that there is a hole in the breast, or that the birth takes place through the mouth. Why did she not select one of the natural openings existing in the abdomen from which things come out daily? The explanation is simple. Very shortly before, our little one had invited some educational criticism on her mother's part by a heightened interest in both abdominal openings with their remarkable products,—an interest not always in accord with the requirements of cleanliness and decorum. Then for the first time she became acquainted with the exceptional laws of these bodily regions and, being a sensitive child, she soon learned that there was something here to be tabooed. This region, therefore, must not be referred to. Anna had simply shown herself docile and had so adjusted herself to the cultural demands that she thought (at least spoke) of the simplest things last. The incorrect theories substituted for correct laws persisted for years until brusque explanations came from without. It is, therefore, no wonder that such theories, the forming of and adherence to which are favored even by parents and educators should later become determinants of important symptoms in a neurosis, or of delusions in a psychosis, just as I have shown that in dementia præcox¹ what has existed in the mind for years always remains somewhere, though it may be hidden under compensations seemingly of a different kind.

But even before this question, whence the child really comes out, was settled, a new problem obtruded itself; viz., the children come out of the mother, but how is it with the nurse?

¹Jung: The Psychology of Dementia Præcox, translated by Peterson and Brill. *Journal of Nervous and Mental Diseases*, Monograph Series, No. 3.

Did some one come out also in this case? This question was followed by the remark, "No, no, the stork brought down the little brother from heaven." What is there peculiar about the fact that nobody came out of the nurse? We recall that Anna identified herself with the nurse and planned to become a nurse later, for,—she, too, would like to have a child, and she could have one as well as the nurse. But now when it is known that the little brother grew in mama, how is it now?

This disquieting question is averted by a quick return to the stork-angel theory which has never been really believed and which after a few trials is at last definitely abandoned. Two questions, however, remain in the air. The first reads as follows: Where does the child come out? The second, a considerably more difficult one, reads: How does it happen that mama has children while the nurse and the servants do not? All these questions did not at first manifest themselves.

On the day following the explanation while at dinner, Anna spontaneously remarked: "My brother is in Italy, and has a house of cloth and glass, but it does not tumble down."

In this case as in the others it was impossible to ask for an explanation; the resistances were too great and Anna could not be drawn into conversation. This former, officious and pretty explanation is very significant. For some three months the two sisters had been building a stereotyped fanciful conception of a "big brother." This brother knows everything, he can do and has everything, he has been and is in every place where the children are not; he is owner of great cows, oxen, horses, dogs; everything is his, etc. Each sister has such a "big brother." We must not look far for the origin of this fancy; the model for it is the *father* who seems to correspond to this conception: he seems to be like a brother to mama. The children, too, have their similar powerful "brother." This brother is very brave; he is at present in dangerous Italy and inhabits an impossible fragile house, and *it does not tumble down*. For the child this realizes an important wish. *The earthquake is no longer to be dangerous*. As a consequence of this the child's fear disappeared and *stayed away*. The fear of earthquakes now entirely vanished. Instead of calling her father to her bed to conjure away the fear, she now became very affectionate and begged him every night to kiss her.

In order to test this new state of affairs the father showed her pictures illustrating volcanoes and earthquake devastations. Anna remained unaffected, she examined the pictures with indifference, remarking, "These people are dead; I have already seen that quite often." The picture of a volcanic eruption no longer had any attraction for her. Thus all her scientific interest collapsed and vanished as suddenly as it came. During

the days following the explanation Anna had quite important matters to occupy herself with; she disseminated her newly acquired knowledge among those about her in the following manner: She began by again circumstantially affirming what had been told her, viz., that Freddy, she, and her younger sister had grown in her mother, that papa and mama grew in their mothers, and that the servants likewise grew in their respective mothers. By frequent questions she tested the true basis of her knowledge, for her suspicion was aroused in no small measure, so that it needed many confirmations to remove all her uncertainties.

On one occasion the trustworthiness of the theory threatened to go to pieces. About a week after the explanation the father was taken sick with influenza and consequently had to remain in bed during the forenoon. The children knew nothing about this, and Anna coming into the parents' bedroom saw what was quite unusual, namely, that her father was remaining in bed. She again took on a peculiar surprised expression; she remained at a distance from the bed and would not come nearer; she was apparently again reserved and suspicious. But suddenly she burst out with the question, "Why are you in bed, have you a plant in your belly, too?"

The father was naturally forced to laugh. He calmed her, however, by assuring her that children never grow in the father, that only women can have children and not men; thereupon the child again became friendly. But though the surface was calm the problems continued to work in the dark. A few days later while at dinner Anna related the following dream: "I dreamed last night of Noah's ark." The father then asked her what she had dreamed about it, but Anna's answer was sheer nonsense. In such cases it is necessary only to wait and pay attention. A few minutes later she said to her mother, "I dreamed last night about Noah's ark, and there were a lot of little animals in it." Another pause. She then began her story for the third time. "*I dreamed last night about Noah's ark, and there were a lot of little animals in it, and underneath there was a lid and that opened and all the little animals fell out.*"

The children really had a Noah's ark, but its opening, a lid, was on the roof and not underneath. In this way she delicately intimated that the story of the birth from mouth or breast is incorrect, and that she had some inkling where the children came out.

A few weeks then passed without any noteworthy occurrences. On one occasion she related the following dream: "I dreamed about papa and mama; they had been sitting late in the study and we children were there too." On the face of

this we find a wish of the children, to be allowed to sit up as long as the parents. This wish is here realized or rather it is utilized to express a more important wish, namely, *to be present in the evening when the parents are alone*; of course quite innocently it was in the *study* where she has seen all the interesting books and where she has satiated her thirst for knowledge; *i. e.*, she was really seeking an answer to the burning question, whence the little brother came. If the children were there they would find out.¹ A few days later Anna had a terrifying dream from which she awoke crying, "The earthquake was coming, the house had begun to shake." Her mother went to her and calmed her by saying that the earthquake was not coming, that everything was quiet, and that everybody was asleep. Whereupon Anna said: "*I would like to see the spring, when all the little flowers are coming out and the whole lawn is full of flowers—I would like to see Freddy, he has such a dear little face—What is papa doing? What is he saying?*" (The mother said, "He is asleep and is n't saying anything now.") Little Anna then remarked with a sarcastic smile: "*He will surely be sick again in the morning.*"

This text should be read backwards. The last sentence was not meant seriously, as it was uttered in a mocking tone. When the father was sick the last time Anna suspected that he had a "plant in his belly." The sarcasm signifies: "To-morrow papa is surely going to have a child." But this also is not meant seriously. Papa is not going to have a child; mama alone has children; perhaps she will have another child to-morrow; but where from? "What does papa do?" The formulation of the difficult problem seems here to come to the surface. It reads: What does papa really do if he does not bear children? The little one is very anxious to have a solution for all these problems, she would like to know how Freddy came into the world, she would like to see how the little flowers come out of the earth in the spring, and these wishes are hidden behind the fear of earthquakes.

After this intermezzo Anna slept quietly until morning. In the morning her mother asked her what she had dreamed. She did not at first recall anything, and then said: "*I dreamed that I could make the summer, and then some one threw a Punch² down into the closet.*"

This peculiar dream apparently has two different scenes which are separated by "then." The second part draws its material from the recent wish to possess a Punch, that is, to

¹ This wish to sit up with the father and mother until late at night often plays a great part later in a neurosis. Its object is to prevent the parental coitus.

² A doll from Punch and Judy.

have a masculine doll just as the mother has a little boy. Some one threw Punch down into the closet; one often lets other things fall down into the water closet. *It is just like this that the children, too, come out.* We have here an analogy to the "Lumpf-theory" of little John.¹ Whenever several scenes are found in one dream, each scene ordinarily represents a particular variation of the complex elaboration. Here accordingly the first part is only a variation of the theme found in the second part. The meaning of "to see the spring" or "to see the little flowers come out" we have already seen. Anna now dreams that she *can make the summer*, that is she can bring it about that the little flowers shall come out. She herself can make a little child, and the second part of the dream represents this just like a passage of the bowels. Here we find the egoistic wish which is behind the seemingly objective interest of the nocturnal conversation.

A few days later the mother was visited by a lady who expected soon to become a mother. The children seemed to take no interest in the matter, but the next day they amused themselves with the following play which was directed by the older one: they took all the newspapers they could find in their father's paperbasket and stuffed them under their clothes, so that the intention of the imitation was quite plain. During the night little Anna had another dream: "*I dreamed about a woman in the city, she had a very big belly.*" The chief actor in the dream is always the dreamer himself under some definite aspect; thus the childish play of the day before is fully solved.

Not long thereafter Anna surprised her mother with the following performance: She stuck her doll under her clothes, then pulled it out slowly head downwards, and at the same time remarked, "*Look, the little child is coming out, it is now all out.*" By this means Anna tells her mother, "You see, thus I apprehend the problem of birth. What do you think of it? Is that right?" The play is really meant to be a question, for, as we shall see later, this conception had to be officially confirmed. That rumination on this problem by no means ended here is shown by the occasional ideas conceived during the following weeks. Thus she repeated the same play a few days later with her Teddy Bear, which functioned as an especially loving doll. One day, looking at a rose, she said to her grandma, "See, the rose is getting a baby." As her grandma did not quite understand her she pointed to the enlarged calyx and said, "You see she is quite thick here."

Anna once quarrelled with her younger sister, and the latter

¹See analysis of a 5-year-old boy, *Jahrbuch f. Psychoanalytische u. Psychopathologische Forschungen*, Vol. I.

angrily exclaimed, "I will kill you." Whereupon Anna answered, "When I am dead you will be all alone; then you will have to pray to the dear Lord for a live baby." But the scene soon changed: Anna was the angel, and the younger sister was forced to kneel before her and pray to her that she should present to her a living child. In this way Anna became the presenting mother.

Oranges were once served on the table. Anna impatiently asked for one and said, "*I am going to take an orange and swallow it all down into my belly, and then I shall get a little child.*" Who will not think here of the fairy tales in which childless women finally become pregnant by swallowing fruit, fish, and similar things.¹ Thus Anna attempts to solve the problem *how the children actually come into the mother*. She thus enters into an examination which hitherto has not been formulated with so much sharpness. The solution follows in the form of an *analogy*, which is quite characteristic of the archaic thinking of the child. (In the adult, too, there is a kind of thinking by analogy which belongs to the stratum lying immediately below consciousness. Dreams bring the analogies to the surface; the same may be observed also in dementia præcox.) In German as well as in numerous foreign fairy tales one frequently finds such characteristic childish comparisons. Fairy tales seem to be the myths of the child, and therefore contain among other things the mythology which the child weaves concerning the sexual processes. The spell of the fairy tale poetry, which is felt even by the adult, is explained by the fact that some of the old theories are still alive in our unconscious minds. We experience a strange, peculiar and familiar feeling when a conception of our remotest youth is again stimulated. Without becoming conscious it merely sends into consciousness a feeble copy of its original emotional strength.

The problem how the child gets into the mother was difficult to solve. As the only way of taking things into the body is through the mouth, it could evidently be assumed that the mother eats something like a fruit which then grows in her belly. But then comes another difficulty, namely, it is clear enough what the mother produces but it is not yet clear what the father is good for.

What does the father do? Anna now occupied herself exclusively with this question. One morning she ran into the parents' bedroom while they were dressing, she jumped into her father's bed, she lay down on her belly and kicked with her legs, and called at the same time, "*Look! does papa do*

¹ Franz Riklin.

that?'' The analogy to the horse of "little John" which raised such disturbance with its legs, is very surprising.

With this last performance the solving of the problem seemed to rest entirely, at least the parents found no opportunity to make any pertinent observations. That the problem should come to a standstill just here is not at all surprising, for this is really its most difficult part. Moreover we know from experience that not very many children go beyond these limits during the period of childhood. The problem is almost too difficult for the childish reason, which still lacks much irremissible knowledge without which the problem cannot be solved.

This standstill lasted about five months during which no phobias or other signs of complex elaboration appeared. After the lapse of this time there appeared premonitory signs of some new incidents. Anna's family lived at that time in the country near a lake where the mother and children could bathe. As Anna feared to wade farther into the water than kneedeep, her father once put her into the water, which led to an outburst of crying. In the evening while going to bed Anna asked her mother, "Do you not believe that father wanted to drown me?" A few days later there was another outburst of crying. She continued to stand in the gardener's way until he finally placed her in a newly dug hole. Anna cried bitterly and afterwards maintained that the gardener wished to bury her. To finish up with, Anna awoke during the night with fearful crying. Her mother went to her in the adjoining room and quieted her. Anna dreamed that "a train passed and then fell in a heap."

We have here repeated the "stage coach" of "little John." These incidents showed clearly enough that there was again fear in the air, *i. e.*, that there again had arisen a resistance against the transposition on the parents, and that therefore a larger part of the love was converted into fear. This time suspicion was directed not against the mother, but against the father, who she was sure must know the secret, but would never let anything out. What could the father be secreting or doing? To the child this secret appeared as something dangerous, so that she felt the worst might be expected from the father. (This feeling of childish anxiety with the father as object we see again most distinctly in adults, especially in dementia præcox, which lifts the veil of obscurity from many unconscious processes, as though it were following psychoanalytic principles.) It was for this reason that Anna apparently came to the very absurd conclusion that her father wanted to drown her. At the same time her fear contained the thought that the *object of the father had some relation to a dangerous*

action. This stream of thought is no arbitrary interpretation. Anna meanwhile grew up a little and her interest for her father took on a special coloring which is hard to describe. Language possesses no words to describe the very special kind of affectionate curiosity which radiated from the child's eyes.

Anna once took marked delight in assisting the gardener while he was sowing grass, without apparently divining the profound significance of the child's play. About a fortnight later she began to observe with great pleasure the sprouting young grass. On one of these occasions she asked her mother the following question: "Tell me, how did the eyes grow into the head?" The mother told her that she did not know. Anna, however, continued to ask whether the Lord or her papa could tell this? The mother then referred her to the father, who might tell her how the eyes grew into the head. A few days later there was a family reunion at a tea, and after everything was over the guests departed. The father remained at the table reading the paper and Anna also remained. Suddenly approaching her father she said, "Tell me, how did the eyes grow into the head?" Father: "They did not grow into the head; they were there from the beginning and grew with the head."

A. "Were not the eyes planted?"

F. "No, they grew in the head like the nose."

A. "Did the mouth and the ears grow in the same way? and the hair, too?"

F. "Yes, they all grew in the same way."

A. "And the hair, too? But the mousies came into the world naked. Where was the hair before? Were there no seeds added?"

F. "No, you see, the hair really came out of little grains which are like seeds, but these were already in the skin long before and nobody sowed them." The father was now getting concerned; he knew whither the little one's thoughts were directed, but he did not wish to overthrow, for the sake of a former false application, the opportunely established seed-theory which she had most fortunately gathered from nature; but the child spoke with an unwonted seriousness which demanded consideration.

Anna (evidently disappointed, and with a distressed tone): "But how did Freddy get into mama? Who stuck him in? and who stuck you into your mama? Where did he come out from?"

From this sudden storm of questions the father chose the last for his first answer. "Just think, you know well enough that Freddy is a boy; boys become men and girls women. Only women and not men can have children; now just think, where could Freddy come out from?"

A. (Laughs joyfully and points to her genitals): "Did he come out here?"

Father: "Yes, of course, you certainly must have thought of this before?"

A. (Overlooking the question): "But how did Freddy get into mama? Did anybody plant him? Was the seed planted?"

This very precise question could no longer be evaded by the father. He explained to the child, who listened with the greatest attention, that the mother is like the soil and the father like the gardener; that the father provides the seed which grows in the mother, and thus gives origin to a baby. This answer gave extraordinary satisfaction; she immediately ran to her mother and said, "Papa has told me everything, now I know it all." She did not, however, tell what she knew.

The new knowledge was, however, put into play the following day. Anna went to her mother and said, "Think, mama, papa told me how Freddy was a little angel and was brought from heaven by a stork." The mother was naturally surprised and said, "No, you are mistaken, papa surely never told you such a thing!" whereupon the little one laughed and ran away.

This was apparently a mode of revenge. Her mother did not wish or was not able to tell her how the eyes grew into the head, hence she did not know how Freddy got into her. It was for this reason that she again tempted her with the old story.

I wish to impress firmly upon parents and educators this instructive example of child psychology. In the learned psychological discussions on the child's psyche we hear nothing about those parts which are so important for the health and naturalness of our children, nor do we hear more about the child's emotions and their conflicts; and yet they play a most important rôle.

It very often happens that children are erroneously treated as quite imprudent and irrational beings. Thus on indulgently remarking to an intelligent father, whose 4-year-old daughter masturbated excessively, that care should be exercised in the presence of the child which slept in the same room with the parents, I received the following indignant reply, "I can absolutely assure you that the child knows nothing about sexual matters." This would recall that distinguished old neurologist who wished to abjudicate the attribute "sexual" from a child-birth phantasy which was represented in a dreamy state.

On the other hand a child evincing a neurotic talent exaggerated by neurosis may be urged on by solicitous parents. How easy and tempting it would have been, *e. g.*, in the pres-

ent case, to admire, excite, and develop prematurely the child's eager desire for learning, and thereby develop an unnatural *blasé* state and a precociousness masking a neurosis. In such cases the parents must look after their own complexes and complex tendencies and not make capital out of them at the expense of the child. The idea should be dismissed once for all that children are held in bondage by, or that they are the toys of, their parents. They are characteristic and new beings. In the matter of enlightenment on things sexual it can be affirmed they suffer from the preconceived opinion that the truth is harmful. Many neurologists are of the opinion that even in grownups enlightenment on their own psychosexual processes is harmful and even immoral. Would not the same persons perhaps refuse to admit the existence of the genitals themselves?

One should not, however, go from this extreme of prudishness to the opposite one, namely that of enlightenment *à tout prix*, which may turn out as foolish as it is disagreeable. In this respect I believe the use of some discretion to be decidedly the wiser plan; still if children come upon any idea, they should be deceived no more than adults.

I hope, ladies and gentlemen, that I have shown you what complicated psychic processes the psychoanalytic investigation reveals in the child, and how great is the significance of these processes for the mental well-being as well as for the general psychic development of the child. What I have been unable to show you is the universal validity of these observations. Unfortunately, I am not in a position to show this for I do not know myself how much of it is universally valid. Only the accumulation of such observations and a more far-reaching penetration into the problem thus broached will give us a complete insight into the laws of the psychic development. It is to be regretted that we are at present still far from this goal. But I confidently hope that educators and practical psychologists, whether physicians or deep-thinking parents, will not leave us too long unassisted in this immensely important and interesting field.

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ABSTRACTS OF LECTURES ON THE PSYCHOLOGY OF TESTIMONY AND ON THE STUDY OF INDIVIDUALITY¹

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FIRST LECTURE

The Psychology of Testimony

1. *Introduction.* Applied Psychology in General. Along side of the purely theoretical psychology, which seeks a knowledge of the elements and laws of the mental life, there is now springing up, as an independent science, an "Applied Psychology." Its purpose is to gather such psychological information as will serve other sciences and especially the practical cultural activities of Education, Law and Medicine. In each of these fields Applied Psychology has a double task: As "Psychognostics" it must provide a scientific basis for practical knowledge of, and judgments upon, human mental acts and qualities; and as "Psychotechnology" it must give assistance in the practical manipulation of human minds.

An uncritical overestimation of this new science (psychologism) is as unreasonable as its underestimation.

A cardinal error, committed especially in the earlier days of this new science, was the attempt to carry over into it unchanged the methods of pure psychology; the thought was to apply the customary laboratory experiments (which, of intention, bring into artificial isolation the elementary psychical functions and are therefore remote from daily experiences) unaltered in the schools and in the courts, whereas the altered setting of the problem requires of course altered methods. Practical life does not deal with elements, but with very complex mental processes; the special methods of applied psychology must therefore take a middle position; they must combine the necessary nearness to life with that degree of exactness which is indispensable for the drawing of reliable inferences.

The Psychology of Testimony offers an illustration of these methodological points of view.

¹Lectures delivered at the Celebration of the Twentieth Anniversary of the opening of Clark University, Sept., 1909; abstracts prepared in German by Professor Stern, and translated by E. C. Sanford.

2. *The Methods of the Psychology of Testimony.* By "Testimony" or "Report" (*Aussage*) we mean the verbal expression of a recollection; and by "Recollection" (*Erinnerung*) a complex of memorial ideas which has reference to a definite objective constellation of facts (*Tatbestand*) in the past. The chief purpose of the study of testimony is the determination of its accuracy, *i. e.*, the degree of its agreement with the actual constellation of facts, and of the conditions upon which this accuracy depends. All experimental methods must therefore permit a comparison of the testimony with the facts to which it relates. Pictures to be carefully examined and then later described from memory furnish the most convenient material and have been most frequently used so far; but since in practical life one has very often to do with reports regarding events, event-experiments (*Vorgangsexperimente*) have also been arranged. Besides these, reports of narratives, of extents of time and space and many other matters have also been worked with.

The comparison of the facts and the report can be made only when the latter has been analyzed into its single statements (*Einzelangaben*) and the percentage of right, wrong and indeterminate statements has been calculated; and, because of the varied character of the statements, it is necessary to calculate separately the proportions for particular categories (*e. g.*, with reference to matters of color or of space relations) as well as to make a general calculation.

Next the conditions affecting the accuracy of the reports must be varied experimentally. The most important difference is here between the "narrative" (*Bericht*) and the "interrogatory" (*Verhör*, testimony given in response to questions, Whipple's "deposition"). In the case of the "interrogatory" form there are also different degrees of suggestion to be considered. Then the interval between the original observation and the report is to be varied; and finally the dependence of the accuracy of the report on the education, age and sex of the person under investigation is to be determined.

3. *Numerical Results.* The first experiments were made with pictures on mature students, both ladies and gentlemen. The reports were in the "narrative" form, without interrogation. The errors in the report, when made immediately after the observation, amounted to 5%, some weeks later to 10%. To distinguish those portions of the report with reference to which the subjects were very certain—so certain that they would be willing to take oath upon them—such portions were underscored. These portions showed a lessened tendency to error, but were not free from it.

A further experiment, with the picture of the living room

in a peasant's house, was made upon children and young people of different ages; and has often been repeated since. The "narrative" resulted in 5-10% of errors; the "interrogatory" in 25-30%. The power of the "suggestive" question showed itself to be dependent in large measure on age—50% of errors in the case of 7-year-olds, 20% in that of 18-year-olds.

An event-experiment was made in my seminar as follows: My lecture was interrupted by the entrance of a gentleman who spoke with me and took a book from the book-case, the performance having been exactly studied beforehand in all its details. The members of the seminar gave but little attention to what was going on. A week later they were required to report upon what had taken place. Result: "narrative" 25% of errors; "interrogatory" 50% of errors.

4. *On the Psychology of the "Narrative" Errors.* These errors fall into four groups:

a. *Errors of Apprehension*, committed during the observation: Overlooking of elements present; misapprehension in consequence of expectation or habituation (*falsche Assimilation*); Sense illusions, Errors of estimation.

b. *Real Errors of Memory*, arising in the interval between the observation and the reporting or in the course of the report: Filling up gaps in recollection in accordance with habit; The use of retained verbal expressions in an altered sense; Gradual amplification of the idea—thus, with reference to two trees in a picture the statement in the first report was "two trees," a week later "a grove," a week later still "a forest."

c. *Errors of Phantasy*: Retouching of the recollection (*Ausschmückung*); Unintentional blending of the imagined with the experienced, or of the experiences of different times; In the case of children, often a quite harmless playing with the report, or invention (*Fabulieren*).

d. *Lack of Will*: Too great credulity with reference to the ideas which offer themselves; too little self-criticism in the case of uncertain recollections.

SECOND LECTURE

The Psychology of Testimony

5. *The Psychology of the Errors in Interrogatory Reports.* Beside the errors which have their sources within the reporting subject, there are others which have an outside source, in particular in the interrogation (*Verhör*). In one way questioning is an excellent means of filling the gaps in a spontaneous report, but in another it is, as experiments prove, a possible

occasion of falsification. The more dependent and easily influenced a man is, the more a question put to him operates as an imperative: You have to know something about this. And as he has usually exhausted in his narrative his store of clear and distinct ideas with reference to the experience, he hunts now among the remaining indistinct and fragmentary recollections for something wherewith to meet the question. This is true of all questions, but in an increased measure of *suggestive questions*, i. e., of those for which a particular answer is readier than others. For the question, "Was the cloth not red?" the answer "Yes" is always readier than the answer "No." The naïve human being is much inclined to affirm any idea presented to him, that is, to credit it with an objective existence. Suggestive questions of this sort operate with especial force in the case of young and uneducated persons; more with women than with men.

The suggestive question is only a special case of suggestion in general, the importance of which in normal psychology has only recently begun to be recognized. We define suggestion, from the standpoint of the person influenced, as "the imitative assumption of a mental attitude under the illusion of assuming it spontaneously" (*Nachahmung einer Stellungnahme unter dem Scheine des eigenen Stellungnehmens*).

Besides the influence of interrogation there are still others which falsify testimony: hearsay, reading about the occurrence, discussion with others who have shared the experience, etc.

6. *Practical Consequences for Pedagogy.* These are of a threefold sort:

a. In school and at home one has constantly brought before him reports by children as to experiences which they have had or stories which they have heard. It is clear that these reports are not worthy, off-hand, of full credence; the above mentioned sources of error must be reckoned with. It is clear also that a report demonstrably false is not necessarily to be regarded as a lie and punished accordingly. The unconscious factors of falsification play a far greater rôle than is commonly supposed; and if one condemns in the case of little children every mistake and every harmless tale of fancy as a lie, he usually succeeds in giving to the child in this way a conception of which the child would otherwise perhaps have remained in ignorance.

b. Since a large part of the falsification in the report is usually a result of questioning, the questioner is himself co-responsible for the false report of the child. These falsifications are for the most part unconscious; and yet they may, under certain circumstances, give place to conscious falsifications, since the child sometimes knows no other way of escaping

the disagreeable compulsion of the question than the invention of an answer. One should therefore interrogate no more than is absolutely necessary and should formulate his questions as "unsuggestively" as possible.

c. Since memory is such an important function it is natural to ask whether we must rest satisfied with its demonstrated imperfection. Is it not possible to secure an improvement by pedagogical means? The question is to be answered affirmatively; just as observation (*Anschauung*) can be systematically cultivated, so can memory. The improvement is subject to experimental demonstration; experiments repeated on the same children (each time of course with a new picture) showed a clear improvement. The chief educative effect was in this case due to *self-correction*. After the making of the report the picture was shown again to the child and he was required himself to discover the errors which he had made. Such exercises of memory may be scattered through the work upon any school topic as opportunity offers.

7. *Practical Consequences for Law.* (The consequences here mentioned have reference in the first instance to German jurisprudence and court procedure. To what extent analogous points of view hold also for American conditions those familiar with the latter must decide.)

a. The first and obvious consequence of the psychology of testimony is a negative one, a diminution of the reliance which is to be placed in the reports of witnesses. The notion, still tolerably prevalent, that the faithfully sworn testimony of a mentally competent witness is in general to be regarded as an exact presentation of reality, is without justification. In Germany the new view has already caused the testimony of children especially to be less highly valued than formerly.

It would be a mistake, however, to ascribe to the psychology of testimony destructive consequences only; its *positive consequences* are still more important.

b. The examining officer is able by the manner of his questioning to predetermine in a measure the degree of the erroneousness of the testimony. The more he leaves to spontaneous narration, and the less "suggestive" his questions, the less will be the danger of falsification.

c. When identification is necessary the witness should make it, whenever possible, by choice from a group of similar persons or things (*Wahlkonfrontation*) and not by indicating whether a single individual presented to him is the one in question (*Einzelkonfrontation*), because of the powerful "suggestive" effect of the latter procedure.

d. Psychological experiment shows what degree of confidence ought in general to be placed in particular classes of

testimony. It teaches, for example, that colors to which particular attention has not been given are especially ill remembered; that times of a few minutes are almost always considerably over-estimated; that the main outlines of an event, if they have been followed with attention and if the witness has not shared especially in the emotions involved, are commonly correctly reproduced; that on the contrary, things observed without attention are very liable to distortion. (For this reason delayed reports with reference to the appearance or clothing of a person not carefully observed are for the most part worthless.)

e. As the psychological study of testimony advances it will become possible for experts of psychological training in *exceptional cases* to offer opinions on the psychical character of important witnesses; the experimental testing of witnesses also, *e. g.*, with reference to their capacity to observe, their suggestibility, their ability to estimate extents of time and space, their memory for colors, seems at least in principle, possible; though, so far, psychological methods are not ripe for it.

f. The best thing of all is, of course, that the jurist himself should be a psychological expert; for this reason it is before all else desirable that jurists should be thoroughly trained in applied psychology and its methods and results. A jurist who has himself been the subject of experiment and thus has seen in his own case how memory functions and how the answering of questions (*Verhørsfragen*) is actually performed, as well as on what conditions these operations depend, will profit from the experience in the technique of his own questioning.

g. The testimony of adolescents and children demands special consideration. While the juvenile offender before the court receives a wholly different treatment from the adult, the juvenile witness is not thus distinguished. It is not borne in mind that the usual procedure of interrogation greatly diminishes the value of child testimony and at the same time puts the juvenile witness in moral peril. The introduction of special investigating magistrates (*Untersuchungsrichter*) for juvenile witnesses, before whom the children should be examined but once and then as soon as possible after the event, is to be desired.

8. *Literature.* The most important titles in the literature of the Psychology of Testimony, as well as collective reviews of it, are to be found in W. Stern's *Beiträge zur Psychologie der Aussage*, 2 vols., Leipzig, 1903-6, and in its continuation, the *Zeitschrift für angewandte Psychologie*, edited by Stern and Lipmann since 1907. In America G. M. Whipple gives in the *Psychological Bulletin*, VI, No. 5, May, 1909, a collective review with bibliography; and a very extended bibliography has also been brought together by Wigmore in the *Illinois Law Review*, III, Feb., 1909.

THIRD LECTURE

The Study of Individuality: General, Psychography

1. *Problems.* In addition to the main problem of Psychology (the investigation of the general uniformities of the mental life) two others now begin to engage attention, which until recently, have been left almost wholly to other disciplines.

The Question of Differences (differentielle Fragestellung) deals with the variations in the particular mental functions. Each may be studied with reference to the degree of its general variability; its qualitative differentiation into "Types," its quantitative differentiation into grades, its genetic differentiation into developmental stages, its relative variations in comparison with other functions, *i. e.*, its correlation.

The Question of Individuality (individuelle Fragestellung) has to do with the knowledge of a single individual personality in and for itself, whether in relation to its total psychical make-up or in relation to a particular aspect, as character, intelligence, etc.

The study of individuality has, up to the present, been a matter either of the historical sciences (biography) or of certain practical disciplines (lists of individualities in schools, alienists' tests of intelligence, characterological indications of the graphologists and the like). There is needed, however, both from a philosophical and from an empirico-methodological point of view, a general scientific foundation for all these undertakings.

2. *The Philosophical Basis of the Concept of Individuality* can here be merely indicated,—for details confer W. Stern's *Person und Sache, System der philosophischen Weltanschauung*, I, and his *Psychologie der Individualität*, to appear in 1910. It is impossible to take an individuality merely as an aggregate of contents of consciousness; for, on the one hand, that which appears in consciousness is by no means identical with the real and essential kernel of individuality; and on the other, the multiplicity of the psychical content is combined into a single organic whole which can be explained only by a unitary purposeful principle of activity (*aus einem einheitlichen zielstrebigem Tätigkeitsprinzip*). Every individuality is therefore a "person" in the sense of the following definition: "A person is such an existence as, in spite of the multiplicity of its parts, presents a real unity, having a character and a value of its own; and as such exhibits, in spite of a multiplicity of subordinate functions, a unitary and purposeful self-activity." (*Person ist ein solches Existierendes, das trotz der Vielheit der Teile eine reale eigenartige, eigenverfüge Einheit darstellt, und als solche trotz der Vielheit der Teilfunctionen eine einheitliche, zielstrebige, Selbsttätigkeit vollzieht.*)

The source of the individual character is to be found neither alone in what is innate (Nativism), nor alone in the operation of outer conditions (Empiricism); but on the contrary, every single phenomenon arises through "convergence of outer and inner factors" (the Convergence Theory).

Since, therefore, the inner capacity of a personality is but a single conditioning factor, which must be supplemented by others, it may properly be called a "Disposition." The disposition of an individual shows itself in a series of single tendencies and capacities which fall into two chief groups; that of the *innate tendencies* (*Anlagen*, developmental tendencies), and that of the *characteristics* (*Eigenschaften*, *Beharrungstendenzen*).

3. *Methodological.* New methods for the empirico-psychological investigation of individuality are now being worked out at different places in Europe. The correlation of psychical characteristics is being studied by Spearman and Kruger and by Heymans; Heymans, Sommer and others are engaged upon inheritance of psychic characteristics, the study of families and the like; in England the recently founded Eugenics Laboratory is especially devoted to this problem. With the problem of the mental endowment and intelligence of school children are busy Binet, Meumann, Stern and others. "Pathography," the analysis of distinguished personalities from a psychopathological point of view, has been developed by Möbius and his followers. "Psychography," as the common foundation of all the methods of individual psychology, is being worked out in our *Institut für angewandte Psychologie*.

4. *Problem and Tendency of Psychography.* All studies of individuality so far suffer from one common defect: The selection of the characteristics and attitudes which have been tested in the individuals examined has been a matter of chance, dependent on subjective preference or preconceived meaning on the part of the investigator. Each biographer has reported particular marks as "essential" for the characterization of his hero; the rest he has disregarded or merely touched upon. No two alienists have made use of the same experiments for testing the intelligence of their patients; arbitrarily selected individual functions have been regarded as symptomatic. Of like arbitrary selection are all the lists of "mental tests" so far proposed; and accident has in the same way determined the rubrics of the "individuality books" and the lists that have been made use of in many schools. The collection of such lists, questionnaires and formularies of individuality, brought together in the Berlin *Institut für angewandte Psychologie*, shows that a veritable chaos reigns in this matter and that in

consequence a comparison of the tests of individuality made use of by different observers is nearly impossible.

It has seemed to us, therefore, a precondition of all further work in this field that a "Scheme of Psychography," of as complete a kind as possible should be worked out, *i. e.*, "a list, arranged in a synoptical manner, of all those characteristics which can in any possible way come into consideration in the study of individuality, without reference to *à priori* assumptions as to whether or not they are essential or to the special purposes of particular studies of character."

The Scheme has not been brought to a point at which each student of individuality may simply fill it out for the personality which he is studying; it furnishes, rather, the stock from which he may select the procedure appropriate to his object. But he must now give account to himself as to why he chooses just the particular points which he does and omits others; and he will take into consideration many points of which he would not otherwise have thought. The Scheme will further be indispensable in all genuine psychological investigations of individuality, correlation, inheritance and the like.

The Scheme must, of course, be completely *neutral*, *i. e.*, it must include the points of view of the historian, the alienist and the educationist as well as that of the psychologist; it must also make specific, for the study of supernormal endowment, the point of view of artistic creation, of scientific production, etc. It is easy to see that such an undertaking can only be carried through by the co-operation of many workers of many professions. The *Institut für angewandte Psychologie* has therefore formed a Commission for Psychography by which recently, after many years of work, a beginning of publication has been made. ("*Ueber Aufgabe und Anlage der Psychographie*" and "*Fragment eines Schemas der Psychographie*" in the *Zeitschrift für angewandte Psychologie*, III, Heft. 3.)

The trend of the Scheme is as follows: When an individual is to be "psychographed," a sharp distinction must be made between the "*attitudes*" (*Verhaltensweisen*) to be observed directly and the "*characteristics*" (*Eigenschaften*) to be inferred from them. The catalogue of attitudes falls again into two groups, according as we have to do with "*natural*" attitudes or those under *experimental* conditions. (Just these natural attitudes resist all schematization as yet; nevertheless they are, on the one hand, the chief material of biographical-historical studies, and, on the other, in the case of psychographing a living individual who can be subjected to experiment, indispensable for completeness. In view of this, the Scheme must try to formulate more exactly the data with reference to natural attitudes in such a manner that they may appear as reactions to

definite stimuli occurring in the course of life, *e. g.*, the attitude toward money, attitude toward affairs, attitude toward extraordinary occurrences.) Finally the Scheme must possess in the greatest possible fullness rubrics covering the *Ætiology* and *Symptomatology* of the individual to be psychographed. *Ætiology*: Data with reference to inheritance, diseases, character of the family, influences of nurture and education, etc. *Symptomatology*: Data with reference to physical form, body mass, physiognomy, expressive movements, voice, etc.

At the start the Scheme will of course contain many *lacunæ* which can be discovered and filled only as it is actually put to use; it is therefore desirable that for the immediate present the Scheme should be put to the test of varied application—historical, psycho-pathological, pedagogical, psychological.

FOURTH LECTURE

The Study of Individuality: The Individuality of the Child

1. *The Little Child.* The conditions for the thorough study of individuality are most favorable in the case of the child during his first six years; for then uninterrupted observation is possible for the parents; then the outer influences can be followed without break, and the empirical and nativistic elements of development can be clearly separated; the expressions of the mental life are still relatively simple; and the children are unconstrained before the observer. In these studies of little children a change from the method so far pursued is desirable, and in this direction, namely: parents must give themselves more and more to co-operative work in observation. The usual limitation to the first three years of life should be given up; many functions begin to show their most interesting development only between the fourth and sixth years. Observation, moreover, should not be confined alone to the most elementary functions; the development of feeling and of character, play, drawings, thought, children's views of the world, and many other matters must be described just as minutely. The various observers must work more from common points of view in order that their results may be more readily comparable. (With this object in view the *Institut für angewandte Psychologie* is beginning to issue a series of guides to the observation of child development.)

2. *The Child of School Age.* Here can be mentioned but one of the most important problems, which requires the close co-operation of Pedagogy and Psychology: *In what way should the organization of the schools and classes be adapted to the differences in the individuality of the children?* So far the organization of the schools has been undertaken almost exclusively

from the objective points of view of the differences in social station and of future calling. Along with these a psychological method of regarding the matter is now beginning to have influence.

3. *The Differences of the Sexes.* The segregation of boys and girls in separate schools has always been undertaken chiefly on non-psychological grounds; and the supporters of co-education have likewise on their part been persuaded that fundamental psychic differences do not exist. Certain psychological experiments seem to confirm this; but these again have been made upon elementary functions, and in these the true differences do not come to light. Studies dealing with complex and higher forms of activity (the relation of receptivity to spontaneity, the direction of interests, spontaneous drawings) show unquestionable differences, which cannot be attributed to influences of the outer *milieu*, but must be regarded as innate. The rhythm and tempo of development also are different in the two sexes.

As co-education is practiced in America to a greater extent than elsewhere, the opportunity for a purely psychological study of the problem is especially favorable.

4. *Organization with Reference to Grade of Endowment.* Differences in the intelligence of children were first recognized in school organization when schools for backward children (*Hilfsschulen*) were introduced. The great mass of "normal" children, however, remained still undifferentiated, though they show extremely marked differences in endowment. The fact that there is "repeating" (the necessary repetition of a grade's work) shows clearly that a certain percentage of the pupils always falls behind the requirements of the class. This circumstance caused Schulrat Sickinger of Mannheim to arrange special classes for these less well endowed pupils. These classes (called *Sonderklassen* or *Forderklassen*) have a less amount to do, fewer pupils per class and a different course of study. They have already been initiated in the larger cities of Germany and seem to justify themselves.

5. *Binet's Tests for Establishing a Scale of Intelligence.* The practical efforts to classify children according to grade of endowment just mentioned demand, however, that reliance should not be placed on the unsupported judgment of the teacher, but that more exact means of determining the capacities of the children should be secured. Many efforts have been made to establish "tests," but all so far have gone to pieces, as far as their main purpose was concerned, for the following reasons: Too much was attempted; it was thought that one might secure by a short series of experimental problems, in a very brief time, a total picture of the individuality.

The list was limited (especially in the older series of tests) far too much to the elemental functions of sense perception, reaction times, mechanical memory, etc., though just these functions are far less characteristic of the special features of individuality than the complex functions. In the case of the complex functions again, it is very hard to separate the actual *capacities* of intelligence (*Intelligenzanlagen*), which it is desired to test, from the objective effects of instruction, training, etc. Thus, for example, many of the alienists' so-called tests of intelligence are really tests of information and scholastic attainment.

It seems, however, that Binet, who has, for more than a decade, been making unwearied studies of the intelligence of school children (cf. the general review by Bobertag, *Zeitschrift für angewandte Psychologie*, III, Heft. 3), has now at last hit upon a practicable method. Its chief advantage consists in this that Binet has determined empirically which of his tests correspond normally to the ability of children at different ages. He is thus in a position to grade each child according to his intelligence-age (*Intelligenzalter*) and thus to say whether his actual age corresponds to this intelligence-age, or whether the child is ahead in his development by one or two years, or behind. It is even possible in this way to assign to the adult feeble-minded their mental level by comparison with the corresponding age of children. Binet has tried to arrange his tests in such a way that they are as independent as possible of acquired knowledge. While he has not attained perfect success, it has been possible, nevertheless, to apply his method with few changes to German children, though in their case the external conditions of instruction are in some respects wholly different. It would seem, therefore, that we are here on the way to a generally applicable method of testing grades of intelligence.

6. *Supernormal Endowments.* Children who differ from normality on the side of excess have so far received the very least consideration from a psychological and pedagogical point of view. Though the supernormal are relatively few in number, their significance for society and human progress is very great. Many "infant prodigies" (*Wunderkinder*) come to early injury in mind and body because they are thoughtlessly forced into publicity. In the schools, on the other hand, exceptional talents may remain undiscovered, because they cannot reveal themselves in the school machine, which must be adapted to the average; and thus they run the risk of degeneration. Kerschensteiner has discovered such instances in the case of artistic endowment. Finally the schools are dangerous for those of exceptional powers because such children do not have

to bring their powers to maximal tension; they do not have to steel their wills and train their sense of duty.

In this case, as before, preliminary pedagogical and psychological work must be done. Supernormal young people must be psychographed with the greatest precision and with reference to every sort of endowment. The significance of inheritance, *milieu*, and education in their development must be determined. We must discover whether there is not possible, even in early life, a clear differentiation between "infant prodigies" in the strict sense (*i. e.*, children with accelerated development, who later soon come to a standstill) and real child geniuses, like Mozart, who afterward as adults retain their supernormality. Finally, the correlation between different sorts of supernormal endowments must be studied, and that between supernormal endowment and general intelligence.

From the practical point of view there must be roused in society the conviction that it has special duties not only toward the mentally inferior, but also toward the mentally superior. Proposals have already been made with this in view which must be tested: Separate classes in the common schools for specially brilliant pupils; élite gymnasia, with wholly different courses of study and different requirements, for picked groups of those most exceptionally talented, without reference to family or property; legal measures to protect the "infant prodigies" from exploitation and to secure for them, remote from publicity, suitable training in their specialties combined with general education.

DIVERSE IDEALS AND DIVERGENT CONCLUSIONS IN THE STUDY OF BEHAVIOR IN LOWER ORGANISMS¹

H. S. JENNINGS

The living interest of the study of the behavior of animals lies in the concrete facts: in what the animals *do*. A kine-matograph would perhaps make the best possible presentation of this subject. But to-day I am going to deny myself the pleasure of presenting the concrete facts, and deal rather, since this is a conference on research, with certain problems of investigation, in the behavior of the lowest organisms. I wish to try to present the main general results of investigation in this study of behavior at its lowest terms, together with its relation to certain general theories; to show why there is such marked disagreement in the accounts given by different investigators; and to point out the fundamental problems for future work. I realize only too strongly that I am not a psychologist, and that my claim to a hearing before psychologists lies only in that my work has been with matters which the psychologist needs to take into consideration. I shall therefore not deal with matters that are psychological in the subjective sense, but with some of the biological relations that underlie psychology.

In recent years a new spirit, a new desire, has permeated biological science in every division,—in brief, the desire *to see the processes of nature occurring*, and to modify and control these processes—not merely to judge what processes *must*

¹ Lecture delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909.

have occurred.¹ In the words of the young Clerk Maxwell² we wish to see the "particular go" of the processes of nature. This is the essential point in the present wide use of the experimental method in biology.

Contrasted with this is an earlier method of work, which may be expressed as follows: Certain conditions were seen to exist. From this, conclusions were drawn as to what *must have occurred*, in order that these conditions might exist. If we succeeded in imagining a process that would satisfactorily account for what exists,—then that was a sufficient explanation. If we found further that this explanation fitted certain other facts, which it was not devised to explain, then it was felt that the explanation was confirmed; was *verified*, even though the supposed process had not itself been observed.

This method of interpretation was long the common one throughout the general biological sciences, zoölogy and botany, and was much in use even in physiology and psychology. The great example is the theory of evolution, together with the special theories grouped about it, concerning the origin of particular organisms, or of particular structures and functions.

In the new spirit of work, the desire is to see things happening, not to conclude what must have happened. If evolution occurs, we wish to *see* it occurring; if acquired characters are inherited, we want to see a few acquired and inherited. We wish to see the processes themselves, not merely the result of supposed processes.

This is the spirit that has led to the recent rebellions against accepted doctrines. Its more thorough-going partisans reject all explanations that are merely devised to explain results. If they can't see evolution occurring, they conclude that it does not occur. They refuse to accept the principle of selection because they do not see it at work. They tell us, with von Uexküll,³ that Darwinism is to be stricken from the list of scientific theories; with Driesch,⁴ that Darwinism fails all along the line. Any explanation that deals with processes not observed is ruled out. The ideal is to build up an account of nature that shall consist entirely of statements that can be verified; that is, in which any process said to occur can be *observed* to occur, if the conditions are properly supplied.

¹Compare the statement of the object of scientific investigation by Loeb, to whom perhaps more than to any other person the prevalence of this ideal is due. (Loeb, J., Preface to *Studies in General Physiology*, 1905.)

²As quoted by James, *Pragmatism*, p. 197.

³Die neuen Fragen in der experimentellen Biologie. *Rivista di Scienza* "Scientia," 1908, vol. 4.

⁴Science and Philosophy of the Organism, vol. 1, p. 269.

It is only by grasping thoroughly this ideal that one can understand the basis for the views set forth by its exponents; the startling conclusions drawn by such men as Driesch, v. Uexküll and Loeb.

The same spirit and method have been carried into comparative psychology, and the first result was to banish that which had been supposed to constitute the very subject under examination. "Comparative psychology" became "animal behavior," for psychological processes cannot be observed in animals, and are therefore ruled out. Their very existence was called in question, and all discussion of them was denounced as idle speculation; comparative psychology was denied a place in science.¹

This spirit has doubtless led to iconoclastic excesses in its zealous partisans; there has been a tendency to forget that within the next ten thousand years many processes may be observed that we have not succeeded in finding in the decade or two in which this spirit has ruled, so that sweeping negative conclusions are hardly warranted. But as a basis for a positive working method the ideal is sound and valuable. We must observe the processes of nature, not merely guess at them. Certain results and problems arising from the study, in this spirit, of the behavior of lower organisms, is what I wish to bring before you. Let us accept the tests imposed by this ideal, and see what we have reached.

Strangely, perhaps, this spirit of work has not succeeded in bringing about agreement in the study of behavior in the lower organisms. As you know, extreme divergences on what seem fundamental matters are found between the accounts given by different sets of experimental investigators in this field. Certain investigators show the phenomena as simple and dominated by easily understood mechanical factors; concrete physico-chemical explanations are presented as throughout satisfactory. The whole matter is set forth in such a way that he who runs may read and understand. Here, one feels, is a field that has been set in order; here the physico-chemical methods of attack have shown themselves adequate. And what a contrast to the results of older methods of study! No psychological discussions, no anthropomorphism, no teleology; no uncertainty, but simplicity, uniformity, constancy everywhere; simple mechanical considerations suffice for all. Truly a triumph of the mechanistic views of life phenomena!

But to the student's perplexity, he finds another group of

¹See for example, v. Uexküll, *Im Kampf um die Tierseele*, reprinted from Asher and Spiro's *Ergebnisse der Physiologie*, Jhrg. 1, 1902, and Nuel, *La Psychologie Comparée est-elle Légitime?* *Archives de Psychologie*, T. 5, 1906, pp. 326-343.

experimentalists, working with equal thoroughness, that give a very different account of these matters. They tell us that behavior in the lower organisms is extremely complex, varied and variable. The simple mechanical explanations are largely rejected as unverifiable and inadequate to the facts. The regulatory character of behavior, which has given rise to teleological and vitalistic doctrines, is insisted upon. Resemblances are pointed out between the behavior of lower organisms, and that of higher animals and man. The striking differences between the behavior of even the lowest organisms, and that of inorganic bodies is set forth.

The members of the first group of investigators thereupon accuse those of the second group of most grievous sins. They accuse them of indeterminism, of anthropomorphism, of "psychologizing," of teleology or finalism; of vitalism.¹ The members of the second group plead not guilty to these charges, and are inclined to respond by characterizing the work of the first group as superficial, misleading and generally inadequate.

Why this divergence? Why should investigators working on the same field under the same principles fail in this radical way to come to agreement?

The divergence appears to me largely due to certain differences in the plan and method of investigation; to difference in opinion as to what knowledge concerning behavior is of worth. There are two diverse ways of attacking the problems of behavior in lower organisms, and these two ways lead naturally to the two divergent sets of views that we have sketched.

1. The first method, and the one giving the brilliantly simple results, may be called the method of the physico-chemical key, or from certain points of view the *synthetic* method. It consists most typically in taking some single physico-chemical principle, or the action of some simple physical agent, and using this as a key to unlock the secrets of behavior. One takes osmotic pressure, or surface tension, or the electric properties of ions, and traces its operation throughout behavior; or he studies the direct action of gravitation, of heat, of light, on the movements of animals. That is, one keeps his eyes on this physico-chemical principle or agent; this, not the organism, forms the unit of work, the object of investigation. Experimentation consists in subjecting organisms to the operation of the principle or agent in question. When we have thus traced the action of the various physico-chemical principles or agents with which we are acquainted, we have the science of behavior; this science is thus built up synthetically from the simplest elements.

We have all seen this method applied, with brilliant results,

¹For a compendium of such accusations, the recent book of Dr. Bohn may be consulted (*La Naissance de l'Intelligence*, 1909). See also Loeb, *Journ. Exper. Zool.*, vol. 4, 1907, pp. 151-156.

in many fields of biology. It has given us in behavior, among other things, the famous tropisms,—the direct, uniform effect of constantly acting physical agents on living organisms.

Those who work in this way commonly hold that it is the only method of work that is worth while. The purpose of investigation is held to be, to work out the physics and chemistry of biological phenomena. The way to do this is evidently to take our known physical and chemical laws, and trace their operation in the biological field. A fundamental principle for this method of work is this: physico-chemical action is constant; it can be depended on. With the same reagent acting on the same material, we must get always the same results. The organism is the material; the reagents to be used are the known chemical and physical ones; the results form our science of behavior.

This is the method of investigation which gives the plain and simple results. The ogres of anthropomorphism, of teleology, of vitalism, that have devoured so many biologists, nowhere so much as show their heads to the traveller upon this route.

2. The second method of study may perhaps be called the analytical method. It is based upon interest in the organism rather than on interest in physics and chemistry, and it makes the organism the unit of work, the object of investigation. The investigator wishes to know all about a given organism. Among other things, he wishes to know its entire behavior, and incidentally whether its behavior is as a matter of fact fully accounted for by known physico-chemical principles, and if not, how much and what is left over.

The actual method of work is to first watch the organism under its natural environment, till one finds out all things it does. Then the environment is changed a little, to see what difference this makes in the behavior. We thus try all sorts of different ways of getting the animal to change its behavior,—including the application of definite chemical and physical reagents of most varied character. We find all the different things the animal can do, and we work out the determining causes and conditions for each. We find all the different ways in which the animal may react to the same stimulus, and we find all the different methods of causing it to give each reaction. We thus find the organism's system of behavior and the things that influence it,—becoming acquainted with the creature as we might get acquainted with a person with whom we are thrown much in contact.¹ We carry on the same sort of work with different organisms, and compare them.

¹ Compare v. Uexküll's statement that the first requirement is "Die andauernde und eingehende Beobachtung des lebenden Tieres in seinem Milieu" (*Leitfaden in das Studium der Experimentellen Biologie der Wassertiere*, Wiesbaden, 1905, p. 75.)

Thus in this method we begin with the complex organism and attempt to analyze its behavior, proceeding to simpler and simpler determining factors, till we get the simplest that can be reached. In this way we must of course finally reach the simple physical and chemical factors with which the investigators by the other method start, provided that the latter are real factors. But since the analysis is difficult and slow, for a long time we are forced to deal with complex components; we separate the original complex mass into smaller and smaller complexes, each to be thoroughly analyzed later. These complex components are not elementary physical or chemical factors. We deal with organisms as wholes, and with such concepts as respiration; the securing of food; protection and defense; care of the young, construction of nests and the like; things which cannot now be expressed in the terminology of physics and chemistry.

Thus the investigator by this analytical method does not agree that work with the elementary chemical and physical factors is the only thing worth while; he finds, in contrast to the worker by the synthetic method, that the relations between these complex, biological components are in themselves decidedly worth while; that they are indeed of the greatest interest and importance. Such are the relations of organisms to each other; the preying of one on another; the conjugation of organisms; the selection of food, and other relations of behavior to metabolism; the relation of behavior to defence and protection, the similarities and differences between the behavior of different organisms, and the like. These things are not physico-chemical concepts, and the relations between them fall outside the field of view of the investigator who, in the synthetic method, works only with such concepts.

These biological interrelations form then a large part of the field of study by the analytical method. But it is of course clear that there is nothing incompatible in all this with further analysis into elementary physical and chemical factors. We merely find it impracticable and useless to wait until such analysis is complete before dealing with the important biological interrelations. Indeed, we should have to deal equally with these biological relations even if the analysis into physico-chemical factors were completed; they would be quite lost sight of if we limited ourselves to an account of the simple chemical and physical factors. The interrelations of mountain, stream and forest are important, but they are not easily set forth in terms of the movements of electrons or ions; and the working of a Hoe printing press is an equally refractory subject for presentation in that way. As Ritter has well emphasized in a recent paper "you can never give a full account of any whole in terms of its elements."¹

¹ Ritter, W. E.: *Life from the Biologist's Standpoint*. Pop. Sci. Monthly, 75, p. 177.

But of course the work of analysis is not finished, in the case of the organism, as in the landscape or the machine, until each part is resolved into the elementary determining factors with which the synthetic method starts.

Thus the synthetic method starts at the bottom and attempts to see how the complex behavior is built up from the simplest elements, while the other method starts with the given complex,—the organism and its behavior,—and attempts to resolve this into its elements. It is of course never possible to classify men absolutely, but typical examples of the different sorts of investigators can be given. For the synthetic method, beginning with the simple chemical and physical principles, the great example is of course furnished by Loeb and his followers. For an example of the investigators on lower animals that begin with the complex and attempt to analyze it, we may name von Uexküll. We may cite also the brilliant work done on behavior in lower organisms under Professor Hodge's direction, in this university. The present speaker has likewise followed this analytical method; and it has almost of necessity been the method employed by workers on higher animals.

Now, unless we are mistaken in our fundamental premise that physico-chemical explanations can be given for behavior, both these methods of work are quite justified, and they must finally, when they have finished their work and covered the ground thoroughly, come to the same results. But one method begins at one end, the other at the other end, and since "science moves but slowly, slowly," we find that at any given time the two have not met; they have not covered the same ground; they do not see the field alike,—and there arise misunderstandings and controversies.

The first method of exploring behavior may be compared to the method of the prospector who goes into a new country seeking gold. His eyes are all for the signs of gold; he may find it and come back laden, as Loeb has done again and again. But he is not so likely to bring with him a correct map of the country as is the surveyor.

The second method of exploring behavior may be likened to that of the geological survey. The first business is to make a topographical map of the country, so that we may guide ourselves and get a general view. The next is to make a systematic and detailed examination of all regions, to find out the relation of river and mountain and forest; of formations, strata and soils.

The surveying party is not so likely as the prospector to return from a given trip with gold, but it is naturally more likely to have made an accurate survey of the country, and to

have determined the various things that are there to be found. It may even be able to correct certain distorted views reported by the prospector. The investigator who works in this way is likely to give a more adequate 'natural history' of behavior than the worker by the other method. He will have a more complete idea of the matters remaining to be worked out, the difficulties to be met, and the relation of the different parts to each other.

It is the difference in the pictures presented by the men working in these two diverse ways that is the main cause of the controversies that have arisen. In other fields of biological investigation we find the same two methods of work, and there appears to be an almost "irrepressible conflict" between their representatives, though the divergences in results are perhaps less crying than in behavior. My present purpose is to try to compare in certain general features the picture presented by the two different sets of workers, in the behavior of lower organisms, pointing out the ground for the divergences.

In the unicellular organisms we have theoretically the simplest condition of affairs that we can find; we have the problem of behavior at its lowest terms. What are the characteristics of this behavior? What bearing have the phenomena here on the possibility of giving physico-chemical explanations for natural phenomena? What relation have they to those three reprobated tendencies or doctrines of which we hear so much of late, in attack and defence, in accusation and recrimination: to vitalism, to anthropomorphism, to teleology or finalism? Why do these doctrines maintain themselves, and how far is there justification for them?

Now, it is evident that the first or synthetic method of study, from its very nature, avoids any phenomena on which these reprobated doctrines could possibly be based, any phenomena not manifestly of a physico-chemical character. It simply does not look at them. It devotes itself to visible physical and chemical matters, leaving the rest out of the field of view. This is done deliberately and intentionally, because it does not consider other matters ripe for treatment. The point of view of such investigators is well expressed by Bohn, in his recent eulogy of Loeb: "as a man of positive science, he does not waste his time reasoning about things that have resisted scientific analysis."¹ I believe that no criticism can be made of this procedure, as a method of work, provided it does not represent as non-existent the parts with which it does not deal. Its chief danger is that it tends to make one forget how much remains

¹—"En homme positif, il ne perd pas son temps à raisonner sur des choses qui ont résisté à l'analyse scientifique." Bohn, *La Naissance de l'Intelligence*, 1909, p. 44.

to be done. To point out the limits of our present knowledge and the problems that remain to be solved is almost as important as to set forth what has already been worked out. And this is particularly true in fields where that which is understood is but a fraction of that which exists. The investigator indeed must keep his eye on what remains to be done, rather than on what has been done.

Thus the freedom from anything vague or uncertain; complex or difficult to understand; anything not resembling common physico-chemical action; anything that could suggest anthropomorphism or finalism or vitalism,—that we find so striking in the accounts of investigators working by the synthetic method, is after all *a priori*, and due simply to the omission of everything of that sort. The reader, finding in these accounts nothing to suggest the difficulties, concludes that the difficulties do not exist; that this is a field where the resolution into physics and chemistry has become complete.

But the worker by the analytic method is unable to escape so easily from the difficulties. Making the complex organism his object of study, interested in this for its own sake, and attempting to omit nothing, he finds himself at once confronted with a mass of phenomena that have not been analyzed into physico-chemical factors; phenomena in the highest degree complex, varied and peculiar. He is even pained to find that many of the proposed physico-chemical explanations are inadequate for the very phenomena which they have been called in to explain. He is forced to deal with that storehouse of materials from which anthropomorphism, finalism and vitalism have drawn their supplies. He endeavors in a preliminary way to analyze and arrange these, and to report to those interested, what one finds when one examines thoroughly the behavior of lower organisms. If he is honest, he is compelled to report even in the lowest organisms many features that resemble features in the behavior of man. He finds inescapable relations between the present actions of the organism and certain later conditions,—resembling what is seen in the purposive action of man. Though these discoveries may be unwelcome, the surveyor with a conscience is forced to set them down on his map and mention them in his description.

And then the storm bursts upon his head. Anthropomorphism! Teleology! Finalism! Vitalism! cries in horror the aggressive physico-chemist, and the rash investigator is drummed out of the mechanistic camp. The teleologist and the theologian seize upon the account of actions resembling those we perform with a purpose, and count the author among their allies. The upholders of vitalism hold out the right hand of fellowship to

the investigator who has shown the inadequacy of physico-chemical explanations.¹

Yet the unfortunate investigator whose sin has been to try to tell the whole truth is still a believer in the validity of physico-chemical explanations; in the necessity of formulating all processes causally; he holds that teleology cannot be substituted for causation, that to perceive the resemblance between man and lower animals does not give a causal explanation of either; he is convinced of the error of vitalism. Rejected from the camp of the physico-chemists, and refusing to take refuge with the enemy, he is left an outcast.

Where is the mistake? Do such accounts of behavior as he gives really imply that physico-chemical explanations are wrong in principle,—as both the vitalists and the aggressive physico-chemist seem to agree that they do?

If they do—alas for physico-chemical explanations—for such accounts are certainly correct! But how incredibly short-sighted; how faint-hearted, is the physico-chemist that takes such a view. These accounts of behavior neither justify finalism and vitalism as substitutes for causal explanations, nor do they refute mechanism. They show merely that there is still much work for us to do; that the end of analysis is by no means in sight; that some of the methods of analysis have been inadequate; that the problems are much more extensive and difficult than some have imagined. They have no more weight in overthrowing physico-chemical explanations than has the existence of an unexplored country, in showing the impossibility of exploration. True, the choice between physico-chemical and vitalistic formulations must for the present, for a large part of the phenomena at least, be based upon *a priori* grounds, not upon demonstration. But whoso has imagined otherwise should remember the saying of Newton, that he had but picked up a few pebbles on the shore of the ocean of knowledge, and should ask himself whether he has really gathered into his pocket that measureless ocean and all its shores. When he has done that, he may have established by demonstration the complete adequacy of physico-chemical explanations; until he has done it, we must rely upon *a priori* considerations.

If we accept from beforehand the programme of physico-chemical or mechanistic explanation, how are we to conceive the facts in the behavior of lower organisms? What are the chief facts discovered in a careful survey; what is their relation to vitalism, to anthropomorphism, to teleology?

¹ See for example Driesch, *The Science and Philosophy of the Organism*, vol. 2, and v. Uexküll, *Die neuen Fragen in der experimentellen Biologie*, *Rivista di Scienza* "Scientia," vol. 4, 1908.

1. Let us consider vitalism first. The experimental investigator is interested in vitalism on account of its practical bearing on the justifiability of his methods of work. He can experiment only by altering in some way the configuration of matter and energy: *i. e.*, by making some physical or chemical change. Can he hope to carry through this method consistently and completely, explaining all divergences in results by differences in the preceding configuration of matter and energy? Or will he find cases of divergence in results where there are no foregoing differences in the configuration of matter and energy, so that from throughout identical configurations diverse results follow? If the latter is the case, then evidently the experimental method fails.

The question here is not merely whether the explanations hitherto commonly used in physics and chemistry are entirely adequate ones. It is the deeper question, whether when adequate principles of explanation *are* used in the physics and chemistry of things not alive, other and diverse principles of explanation will be required for the study of living things. The question is as to whether there is a real, fundamental diversity between the necessary principles of explanation for living and for non-living things.

To hold that the necessary principles of explanation are not diverse in the two cases; to hold then, in opposition to vitalism, that physico-chemical principles of explanation are generally adequate, is to hold this:

What happens in any system of matter and energy at any period is determined by the configuration of matter and energy at a preceding period. Experimentally, therefore, differences in resulting conditions in any two cases will always be found preceded by differences in foregoing conditions, so that nothing happens without its determining factors in the previous configuration of matter and energy. If we search with sufficient care, we shall always be able to find in matter and energy a determining factor for everything that occurs. Two identical combinations of matter and energy cannot produce different results, nor two different combinations absolutely identical results.

This of course leaves open the question whether there may not be present in certain cases additional, subjective, properties, and also, whether it may not be proper to make, besides the physico-chemical explanations, other explanations that take into consideration these subjective properties. Furthermore, it does not deny that there are in living things combinations of matter and energy not found elsewhere, so that methods of action may occur that are not found elsewhere; to this we return later.

In attempting to understand and explain the behavior of

the lower organisms, one of the chief stumbling blocks has been a preconceived idea as to what we should find. Many have imagined these creatures to be a sort of link between organic and inorganic material. Higher animals it is generally recognized are complex structures, comparable in this respect to machines. In the lower organisms it was expected that we should find mere masses of a certain sort of material, and the study of behavior would be merely the study of the chemistry and physics of this material. This idea has perhaps been most explicitly developed by Le Dantec.¹ This *a priori* conviction, often unformulated, maintains itself most obstinately in all thought on the behavior of lower organisms, particularly of those composed of but a single cell.

The most fundamental result of the study that has been made is to show the incorrectness of this idea; to show that lower organisms, like higher ones, are typical *arrangements* of material; are structures; are in this respect machine-like; not masses of a uniform substance.

This is evident both from a study of the activities of these organisms, and from a direct examination of their structure. Such a unicellular creature as Stentor has many systems of differentiated organs, often acting independently of one another; its structure can only be characterized as inconceivably complex. Paramecium with the microscope is seen to be a most complicated machine, running at a high rate of speed. In studying the behavior of these creatures, what we find out is *how certain machines work*, rather than the direct physical and chemical properties of a certain substance.²

The practical difference in the results of study, due to this fact, is perhaps much greater than appears at first thought. To this difference between what was expected and what was found are due most of the paradoxes and difficulties in behavior, and most of the apparent failures of direct physico-chemical explanations. To it are due the recrudescence of anthropomorphism, finalism, vitalism. Let us try to see how these things come about. In so doing I shall have to remind you of certain facts that are sufficiently obvious, yet that have been neglected of late in work on lower organisms.

The first principle of physico-chemical explanations is that the chemical and physical properties of the living substance

¹ *La Matière Vivante*. Paris, 1895.

² Whether, from other points of view, an organism is not also something more than a machine, is another question. If we mean by a machine any system in which the configuration of matter and energy determines what happens, then the contention in the text is that for purposes of causal explanation of what happens only this machine-like character requires consideration.

determine its reactions, so that from a knowledge of these properties we can predict the reactions; and further that the same reagent acting on the same substance is bound to produce the same result. Any statements to the contrary are looked upon as controverting the principle of causal determination and leading to vitalism.

But when the substance is arranged in typical ways, this principle, though essentially true, becomes practically false and misleading. From the same mass of substance we can make many different arrangements or machines, acting in entirely different ways, so that we could never predict the reactions of the machines from a knowledge of the chemical and physical properties of the unarranged substance. From a certain mass of material we could make either a clock or a doorbell or a steel trap or a musical instrument,—and we could easily so arrange these that each would respond in its characteristic way when acted upon by an electric current. We could, moreover, make the same machines, showing the same reactions, from a different kind of material, with different properties. We could then never predict the reactions of these by knowing merely the chemical and physical properties of the material of which they are composed. The specific action of each depends on the specific arrangement of its material.

This is exactly what we find in organisms, including the lowest as well as the highest. From it there result certain relations that are extremely perplexing, though they can be illustrated from inorganic combinations as well as from organic ones. Let us examine some of these.

First, both in inorganic arrangements or machines and in organisms we find that the same substance reacts to a given reagent sometimes in one way, sometimes in another. It all depends on how the material is arranged;—whether as a clock or as a doorbell; whether as a Stentor or as a Paramecium. Furthermore, by a slight shifting of the arrangement, we find that the very same piece of material is caused to react to the same reagent in entirely different ways. A typewriter responds to mechanical stimulations by printing English lower case letters. After momentary pressure of a certain lever, it responds to the same stimulations by printing capital letters, or by printing numbers, or conventional signs. It would be easy to so arrange it that after a shift of a lever, it would respond with script or italics or German or Russian or Greek letters. Here we have parallel conditions to what we find in lower organisms. What we find to be true for one organism or one individual turns out not to be true for another, and even what we find to be true for a given individual will not hold later for the same

individual. The principle of the *shift* in arrangement comes into play continually, giving us most inconstant results. Yet there is no breach of determinism here; the determining feature lies both for the machine and for the organism in the arrangement of parts.

In view of these facts, it is not surprising that we often get nothing fundamental by determining the action of a given chemical or physical agent on living substance. It is often assumed, tacitly or openly, that after such a determination is made its results can be transferred to other masses of living material; can be generalized. But the effects seen are usually due to the characteristic arrangement of the material acted upon; they disappear or are reversed as soon as we work with material in other arrangements. We cannot therefore expect the study of the direct simple action of chemical and physical agents to help us greatly in understanding why an animal does what it does, though this has been heralded as the one right way to study behavior. From the action of the same agent most diverse results follow, depending on the arrangement of the material on which it acts.

Second, we find, both in machines and in organisms, that a mass of substance may respond in the same way to reagents of the most diverse kind, reagents having varied and even opposite effects. The avoiding reaction in *Paramecium* may be caused by heat and by cold; by acids, by alkalies, and by salts; by electrolytes and by non-electrolytes; by increase of osmotic pressure and by decrease of osmotic pressure; by chemical action without change of osmotic pressure; by mechanical shock and by electric shock; and this is a type of what we find in organisms. How often of late in the history of comparative physiology have we seen a certain effect attributed to one specific physico-chemical principle after another,—always on the assumption that the direct physical action of the agent is the essential point. Increase in osmotic pressure is first heralded as the essential point, until we find that decrease in osmotic pressure has the same effect, and that chemical change without change in osmotic pressure has likewise this effect. Then positively charged ions are made responsible, till we find that negatively charged ions will produce the same effect. And so the gamut is run; till heat, cold, mechanical shock, and the most diverse agents are found acting in the same way.¹

Parallel results are easily obtained from combinations of inorganic material. Imagine an arrangement such that when an electric connection is made, some characteristic action is per-

¹For an example lying outside the field of behavior, the history of the theories of artificial parthenogenesis is most instructive.

formed; for example, a bell is rung. It is easy to so arrange that reagents of opposite character shall make the connection and so ring the bell. Thus the electric button could be placed on a support between and close to an upper and a lower post, contact with either of which completes the circuit. Now, heating the support would lengthen it and cause contact with the upper post, while cold would shorten it and cause contact with the lower post; in either case the bell would ring. Similarly, it would be easy to so arrange a circuit that addition of acid or alkali or any electrolyte would close it; or even so that non-electrolytes would have the same effect. By having a somewhat complex structure, the most varied reagents would all close the circuit and ring the bell. This is the sort of thing we find in organisms. From diverse reagents we may get the same reaction; from the same reagent we get sometimes one result, sometimes another.

It is this condition of affairs that has brought upon the head of the investigators that report it accusations from the narrower physico-chemists of indeterminism, of vitalism, and from the vitalists claims that physico-chemical explanations have failed.

Yet we find the same relations in the inorganic combinations that we call machines. In machines do the physico-chemical properties of the material determine its action? Is it proper to study these physical and chemical properties in order to understand how the machine acts?

Evidently these questions are to be answered *yes!* Only, we must study these properties intelligently, recognizing the fact that the properties due to a certain arrangement of material are among the most important of all, for it is to this arrangement that the specific action of the machine or the organism is due. From a mere study of the properties of unarranged iron, ivory, paint, ink, and of the action of various agents upon them, we could never understand the typewriter. So from a mere study of the unarranged material of organisms and the action of agents upon them, we can never hope to understand their behavior.

Herein lies the failure or inadequacy of much of the physico-chemical work along these lines; it has dealt mainly with the properties of unarranged material, when the arrangement is precisely the essential point. There is among certain general physiologists an intense prejudice against all morphology; a cardinal point of faith is that structure is of no account. By taking this stand, they play directly into the hands of the vitalists. Vitalistic theories flourish as a result of too simple statements of the problems, and too simple solutions, on the part of the physico-chemists. If we maintain that physico-chemical explanation means that behavior in

lower organisms is the direct result of simple chemical and physical action on a certain kind of substance,—then such explanation undoubtedly fails, and the vitalist triumphs.

What is most needed is that the physico-chemical student of biology shall realize that as matter takes on new arrangements, its activities and reactions become different, even though the properties of each constituent part may remain the same. Since in living things there are beyond doubt arrangements differing from anything found elsewhere, we are of course certain to find in living things ways of acting that differ from anything found elsewhere. Hence we cannot expect to find in the physics and chemistry of inorganic matter the full explanation of the activities of organisms; those who expect to do this are following a will-o'-the-wisp,—and this is certain from physico-chemical principles themselves. The physicist and chemist must study organisms in order to fully understand physics and chemistry, just as the biologist must study physics and chemistry in order to understand organisms.¹

The arrangement of the material is then the essential point in determining behavior. What then becomes from the mechanistic standpoint the fundamental problem of behavior? Is it not the question of how these arrangements of material arise, and how they become changed? This property of taking on typical arrangements and of changing these arrangements is the fundamental and essential property of living matter that requires study for the physico-chemical understanding of behavior.

Of such study hardly a beginning has been made. With regard to the minute internal physical changes in the taking on of new arrangements, we have merely some faint suggestions from the rearrangement of particles in the hysteresis of

¹Some writers have applied the name vitalism to the idea that new methods of action arise when new combinations occur, taken in connection with the view that new combinations are found in living things; so apparently Radl (*Geschichte Biologischer Theorien*, vol. 1, p. 81). But such vitalism involves no new principle of explanation; it is based upon conditions found in chemistry and physics as decidedly as in biology. New methods of action arise when oxygen and hydrogen combine, producing water; new methods of action arise when a mass of brass and iron is arranged in the form of a clock. How then can it fail to be true in the case of organisms? The study of physics and chemistry is the study of the methods of action of matter and energy, whether simple or in combination. No new principle of explanation is involved simply because the combinations studied are those in living things. This view seems therefore to the writer far from a vitalistic one. On this point, see the excellent discussion by O. Hertwig, *Der Kampf um Kernfragen der Entwicklungs- und Vererbungslehre* (Jena, 1909), pp. 55-81; notably p. 80.

colloids. A little more has been done in tracing the external manifestations of these changes in the individual organism, through the study of changes of behavior in different physiological conditions, and in the formation of habits and associations. The most important part of the problem lies in the question of how diversities of arrangement arise during the racial history.

It is here that the problem of behavior opens into the more general problems of heredity, variation and evolution. This is the field that underlies the study of behavior. How does the living substance become modified in the lapse of time, so as to take on new arrangements, and therefore to behave differently? On this, if we stick to our ideal of demanding to observe the processes as they occur, little has been accomplished. Von Uexküll, with this ideal in view, feels that a correct statement is this: that all we know about this process is that it does not occur as Darwin thought it did.¹ This is the central physico-chemical problem for a causal understanding of behavior. Compared with it, the study in living things of the changes in surface tension, osmotic pressure, the nature of solution, and the like, though important in themselves, can give us little help, save as they may underlie and finally lead to a knowledge of the properties and laws in accordance with which living matter takes on and changes its method of arrangement. This central problem of behavior is likewise the central problem of all biology.

Thus the condition of affairs we have sketched does not lead to indeterminism; to belief in the failure of physico-chemical explanations; to vitalism. It merely leads us to perceive that the problem is more complex than has been supposed; that the fundamental question is that regarding the production of arrangements in the living substance, and that the solution of this problem lies in the future.²

We have spoken of vitalism. What we have thus far set forth bears upon the problems of anthropomorphism, and of finalism or teleology, almost as directly as it does upon vitalism. We need therefore to touch upon these but briefly.

2. Anthropomorphism signifies unjustifiably reading into lower organisms the characteristics, particularly the mental

¹Von Uexküll: Studien über den Tonus, V. Zeitschr. f. Biol., vol. 50, p. 168.

²I need not say that this discussion is not presented as a "refutation" of any special brand of vitalism, for example, that of Driesch. For such a refutation the precise arguments set forth in support of vitalism would have to be taken up and overcome. I have here tried merely to set forth the attitude I have reached after some years of work on behavior.

ones, that we find in ourselves, and especially it signifies substituting these for a causal explanation. This is a serious error. But it has nothing to do with another question, with which it is often confused. This other question is, whether the behavior of animals resembles in any features the behavior of man. This is purely a question of objective fact, not one for prejudice or for *a priori* considerations of any sort. The only way to answer it is to learn the objective facts for man and for animals, and then to compare them, observing where there are resemblances, where differences. To see such an objective comparison proposed seems to arouse all the fighting instincts of some of our ultra physico-chemical friends, just as it does some of our theological friends. But if we persist in making it undisturbed, we undoubtedly find many fundamental resemblances, along with many differences, between the behavior of even the lowest organisms and of man. Some of these are: the fact that reactions are due to the release of internal energy; that action may occur without specific external stimulus; that action is modified by internal changes of the most varied character, many of which are parallel in man and protozoan; that negative reactions are given mainly to injurious agents, positive ones to beneficial agents; that varied reactions occur under the influence of a single constant stimulus, and that the organism tends to persist in that reaction which keeps it in conditions favorable to its life processes.

To point out these and similar resemblances is merely to point out the facts, with which we must all come to some sort of a working compromise. The existence of organisms whose behavior has these characteristics is not inconsistent with physico-chemical explanation, if physico-chemical explanation is valid, for man does exist. No question of fundamental principle is then involved when we find that other organisms have these characteristics; the question is merely as to the distribution of characteristics known to exist.

The problem of behavior then is: How are such characteristics to be explained from the physico-chemical point of view? If the practical physico-chemist declares that they cannot ultimately be so explained, he merely condemns his own methods of work and places himself among the vitalists. For such faint-heartedness there is surely as yet no justification! We have indeed to attack certain problems hardly yet approached, —the study of the physico-chemical properties in virtue of which certain materials become arranged in such characteristic ways as to produce the phenomena we have mentioned.

3. The matter of teleology or finalism is in similar case. We find as a mere matter of fact, certain marked relations be-

tween a present process and something that exists later. These relations resemble in many ways the relations between action that in man is accompanied by a purpose, and the result of that action. We find such relations in many fields besides behavior; the physiologist is compelled to recognize them everywhere. In the study of behavior it has become a sort of popular fad to ignore these relations; to act as if they did not exist. These are merely the tactics of the ostrich. We must face the problems which nature sets us. When the lens of the eye develops in the dark, it is mere cowardice to try to act as if we did not know that this lens is so constituted as to bring light to a focus. When the pancreas secretes an enzyme, it is again struthionic tactics to refuse to see the relation of that enzyme to the digestion of food,—although this digestion does not take place till after the secretion has occurred. Behavior in lower organisms is an almost continuous tissue of such relations; they are largely what we call the regulatory features of behavior.

When the ultra physico-chemist assumes that the pointing out of these extraordinary relations is given as an explanation of them, he shows most surprising naïveté. They form precisely the most difficult, the most complex, problem for causal explanation. The question is; How were such relations brought about? This is a question for precisely the same kind of objective investigation as the question how any other relation was brought about. How does the boulder happen to lie in the middle of the plain? How does the lens get into the optic cup? How does the lens happen to be of such a form as to bring light to a focus? How does the animal happen to react in such a way as to protect itself? The answer in every case lies in tracing the processes by which the relations were brought about, and in discovering the laws of these processes; by beginning with the condition where these relations do not exist, and tracing the "particular go" of the changes until these relations do exist.

How the relations that impress us as teleological were brought about constitutes undoubtedly a set of most difficult problems. But to keep us from despairing, we find this process taking place in the lives of individuals in a manner that can readily be studied. This is in the formation of habits. In the formation of habits, we see that the organism at first does not react in a way that impresses us as teleological, while later it does, and we can watch the process of change from one condition to the other, and discover how it is causally determined. Since then a method of action that appears to us teleological is produced in an intelligible way under our very eyes, in the lifetime of the individual, there is no reason why we

may not expect to find out how teleological relations have been brought about in the life of the race, when we have actually made a start in the study of the physiology of racial processes.¹ It seems clear that the apparent relation of a present process or structure to something that comes later in time is always due to the fact that this future something has in fact acted upon the organism in the past. The present condition fits the future condition only because of a certain constancy in the universe, through which the 'something past' reappears again in the future.

Let us then attempt in closing to characterize behavior as we find it in its lowest stages, recapitulating the chief points we have made. We find in lower organisms, as in higher animals, that the nature of the reactions is due mainly to characteristic *arrangements* of material, not to the properties of simple unarranged substance. These lower organisms therefore furnish problems which do not differ in kind from what we find in higher animals. They are simpler only in a numerical sense, — in that their parts are less numerous than those of higher animals. It would be most interesting if we found in these lower creatures a half way stage to inorganic matter; if we found living matter without characteristic arrangements, so that its properties and actions were those of an undifferentiated substance. But perhaps the chief result of research is to show that we do *not* find this condition realized. Doubtless this is a great disappointment, much diminishing the supposed importance of studying the lowest organisms. But we must bow to the facts.

In the behavior of these lower creatures we do not find that uniformity which certain physico-chemical theories of behavior demand. With certain underlying conditions in common, extreme diversities in methods of action are the rule. To the same stimuli different organisms react differently; different individuals of the same species react differently, and even the same individual reacts differently at different times. As Walter has well said "strictly speaking, all behavior is individual behavior,"² and Driesch³ has shown his usual acumen in setting

¹ The statement is sometimes made that we can never hope to reduce teleological relations to causal relations (see v. Uexküll, *Leitfaden in das Studium der experimentellen Biologie der Wassertiere*, 1905, p. 129). This doubtless means that the teleological relations remain, even after the process by which they are brought about has been explained causally. It certainly cannot be maintained, in view of the known process of forming useful habits, that the process itself cannot be understood from a causal standpoint.

² Walter, H. E.: *The Reactions of Planarians to Light*. *Journ. Exper. Zool.*, 5, 1907, p. 97.

³ Driesch, H.: *The Science and Philosophy of the Organism*, 1908-9.

forth individuality as the central problem of biology. For the purposes of physico-chemical explanation, individuality in behavior is an outgrowth of the fact that there is practically infinite diversity in the arrangement of living substance, so that no two specimens of it are precisely alike, therefore they do not act precisely alike. Behavior in lower organisms presents itself exactly as it would if the theory of descent with unlimited modifiability were true,—every individual forming a centre from which modifications may and do diverge in many directions. If we abandon for a moment our requirement of seeing evolution occur before we accept it, and assume that it *has* occurred, then we should hold that lower organisms are not really more primitive than higher ones; each may have as long a history and as many modifications behind it as a higher animal. They would be conceived merely as creatures that have retained certain numerically simple arrangements, because they thus fit some otherwise unoccupied nooks and crannies of the universe.

The great problem of behavior then, as for biology in general, is to work out those properties of living matter and of the environment, by which characteristic arrangements of material are produced and modified. In all these typical arrangements or structures that we call organisms, including the protozoan and man, there are certain common features in behavior; the pointing out of these common features is at times denounced as anthropomorphism. Again, in the behavior of these typical arrangements of material, we observe certain relations of present actions to later conditions; these relations we call teleological. But how these conditions and relations are brought about is essentially a physico-chemical problem, in the sense that we can study only the processes and configurations of matter and energy from which they result. The entire actual situation in behavior is that on which theories of vitalism have been based. It can truly be said that the condition of affairs found in behavior is very nearly that set forth by the vitalists as a basis for vitalism; their conception of the gross facts of behavior is more nearly accurate and adequate, from a descriptive standpoint, than is that set forth by the simplifying physico-chemists. The vitalists take into consideration all the phenomena, while the ultra physico-chemists leave out of account the most interesting ones.

But this does not mean that vitalism is anything more than a name for what we have not yet worked out; it does not mean the giving up of the ideal of essentially physico-chemical or mechanistic explanation. It means merely that we must recognize the enormous complexity and difficulty of the physico-

chemical problem ;¹ must realize that we have hardly gotten hold of the first threads for unravelling the puzzle yet; that we have, indeed, hardly attacked the real problem, save in the mass and by analysis into components that are themselves inconceivably complex. The central problem, of working out the laws and processes by which typical arrangements of matter and energy are produced and modified in organisms, presents itself as a problem to be attacked only by the essentially physico-chemical methods through which all the real causal explanation that we have has thus far been reached.

¹ "Nature cannot be made simple by treating her on the theory that she ought to be so, when as a matter of fact she is not." Ritter, l. c., p. 187.

PSYCHOLOGICAL PROBLEMS IN ANTHROPOLOGY¹

By FRANZ BOAS

The science of anthropology deals with the biological and mental manifestations of human life as they appear in different races and in different societies. The phenomena with which we are dealing are therefore, from one point of view, historical. We are endeavoring to elucidate the events which have led to the formation of human types, past and present, and which have determined the course of cultural development of any given group of men. From another point of view the same phenomena are the objects of biological and psychological investigations. We are endeavoring to ascertain what are the laws of hereditary stability and of environmental variability of the human body. These may be recognized in the historical changes that the bodily appearance of man has undergone in the course of time, and in his displacement from one geographical or social environment to another. We are also trying to determine the psychological laws which control the mind of man everywhere, and that may differ in various racial and social groups. In so far as our inquiries relate to the last-named subject, their problems are problems of psychology, though based upon anthropological material. I intend to speak of this aspect of anthropology to-day.

The fundamental problem on which all anthropological inquiry must be founded relates to the mental equipment of the various races of man. Are all the races of mankind mentally equally endowed, or do material differences exist? The final answer to this question has not been given, but anatomical observations on the various races suggest that differences in the form of the nervous system are presumably accompanied by differences in function, or, psychologically speaking, that the mental traits which characterize different individuals are distributed in varying manner among different races; so that the composite picture of the mental characteristics of one race would presumably not coincide with the composite picture of the mental characteristics of another race. The evidence that has been brought forward does not justify us,

¹ Lecture delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909.

however, in claiming that the characteristics of one race would be an advance over those of another, although they would be different.

This question has also been approached from the standpoint of racial achievement. It has been pointed out that only the white race and the Mongolian race have reached any high grade of cultural development, and on this basis it has been assumed that the other races of man have not the ability to reach the same grade of civilization. It has been shown, however, that the retardation of the other races is not necessarily significant, because the amount of retardation is small as compared to the time consumed in reaching the present stages. It would seem, therefore, that the weight of evidence is, on the whole, in favor of an essential similarity of mental endowment in different races, with the probability of variations in the type of mental characteristics. Further inquiries into this subject must be based not only on sociological studies, but also on anatomical, physiological, and psychological inquiries among individuals belonging to the distinct races of mankind.

While the problem that I have just outlined relates to hereditary racial differences, a second fundamental problem of anthropology relates to the mental characteristics of social groups regardless of their racial descent. Even a superficial observation demonstrates that groups of man belonging to distinct social strata do not behave in the same manner. The Russian peasant does not react to his sense experiences in the same way as does the native Australian; and entirely different from theirs are the reactions of the educated Chinaman and of the educated American. In all these cases the form of reaction may depend to a slight extent upon hereditary individual and racial ability, but it will to a much greater extent be determined by the habitual reactions of the society to which the individual in question belongs.

The reaction of a member of a society to the outer world may be twofold. He may act as a member of a crowd, in which case his activities are immediately determined by imitation of the activities of his fellows; or he may act as an individual; then the influence of the society of which he is a member will make itself felt by the habits of action and thought of the individual.

I have discussed the racial question repeatedly at other places. The problem of the psychology of the crowd is a peculiarly intricate one, based largely upon the data of social psychology in a wider sense of the term, and upon data of individual psychology. I may be allowed for these reasons to confine myself to-day to the third of the problems which I have

outlined, that of the psychological laws which govern man as an individual member of society.

This problem has been the object of intensive study by the great minds that have laid the foundation of modern anthropology. The ultimate aim of Waitz's great work is the inquiry into the question whether there are any fundamental differences between the mental make-up of mankind the world over, racially as well as socially. Tylor, in his brilliant investigations on the development of civilization, showed the common occurrence of similar types of ideas the world over, and demonstrated the possibility of conceiving of the scattered phenomena as proof of certain tendencies of evolution of civilization. The many investigators who have studied the evolution of marriage relations, the evolution of law, of art, of religion, all start from the same basis—the assumption of a general similarity of mental reaction in societies of similar structure. Bastian has tried to prove by the use of anthropological data that man the world over develops the same elementary ideas, on which the fabric of his mental activities is based; and that these elementary ideas may be modified by geographical and social environment, but that they remain essentially the same everywhere.

It may be well to illustrate the facts here referred to by a few examples. In the domain of industrial activity we find that mankind is everywhere in possession of the art of producing fire by friction, that everywhere food is prepared by cooking, that shelters are built, that tools are used for breaking and cutting. We do not know mankind in any stage where any of these inventions are absent. In regard to social structure we find that man nowhere lives alone; that even the cases in which the social group consists of members of one family only, are exceedingly rare and of temporary occurrence. We furthermore find that the social units are subdivided into groups, which are kept apart by customary laws forbidding intermarriages in one group, and prescribing intermarriages in another.

In the domain of religion an idea of this type is that of life after death. There is probably no people that believes in the complete extinction of existence with death, but some belief in the continuity of life seems to exist everywhere. To the same domain belongs that type of concepts of the world, in which the surface of our earth is considered as forming a central level, above and below which other worlds are located.

An examination of the types of ideas represented by the few examples that I have here given shows that their subject-matter is highly complex, and that in a strict sense the occurrence of these ideas by itself does not explain clearly the psychological

processes that produce them and that cause their stability. Attempts at a psychological interpretation of these concepts have often been made by means of a comparative treatment of similar ideas, and by endeavors to arrange these ideas in such a way as to show a more or less rationalistic development of one from the other. While this may be feasible in some cases, it does not seem likely that this method of treatment will lead us to the most generalized laws governing the forms of thought in human societies.

The principal obstacle in the way of progress on these lines seems to my mind to be founded on the lack of comparability of the data with which we are dealing. When, for instance, we speak of the idea of life after death as one of the ideas which develop in human society as a psychological necessity, we are dealing with a most complex group of data. One people believes that the soul continues to exist in the form that the person had at the time of death, without any possibility of change; another one believes that the soul will be reborn in a child of the same family; a third one believes that the souls will enter the bodies of animals; and still others that the shadows continue our human pursuits, waiting to be led back to our world in a distant future. The emotional and rationalistic elements which enter into these various concepts are entirely distinct; and we can readily perceive how the various forms of the idea of a future life may have come into existence by psychological processes that are not at all comparable. If I may be allowed to speculate on this question, I might imagine that in one case the similarities between children and their deceased relatives, in other cases the memory of the deceased as he lived during the last days of his life, in still other cases the longing for the beloved child or parent, and again the fear of death—may all have contributed to the development of the idea of life after death, the one here, the other there.

Another instance will corroborate this point of view. One of the striking forms of social organization, which occurs in many regions wide apart, is what we call totemism,—a form of society in which certain social groups consider themselves as related in a supernatural way to a certain species of animals or to a certain class of objects. I believe this is the generally accepted definition of totemism; but I am convinced that in this form the phenomenon is not a single psychological problem, but embraces the most diverse psychological elements. In some cases the people believe themselves to be descendants of the animal whose protection they enjoy. In other cases an animal or some other object may have appeared to an ancestor of the social group, and may have promised to become his protector, and the friendship between the animal and the ancestor

was then transmitted to his descendants. In still other cases a certain social group in a tribe may have the power of securing by magical means and with great ease a certain kind of animal or of increasing its numbers, and the supernatural relation may be established in this way. It will be recognized that here again the anthropological phenomena, which are in outward appearances alike, are, psychologically speaking, entirely distinct, and that consequently psychological laws covering all of them can not be deduced from them.

Another example may not be amiss. In a general review of moral standards we observe, that, with increasing civilization, a gradual change in the valuation of actions takes place. Among primitive man human life has little value, and is sacrificed on the slightest provocation. The social group among whose members any altruistic obligations are binding is exceedingly small; and outside of the group any action that may result in personal gain is not only permitted, but even approved; and from this starting point we find an ever-increasing valuation of human life and an extension of the size of the group among whose members altruistic obligations are binding. The modern relations of nations show that this evolution has not yet reached its final stage. It might seem, therefore, that a study of the social conscience in relation to crimes like murder might be of psychological value, and lead to important results, clearing up the origin of ethical values; but I think here the same objections may be raised as before, namely the lack of comparable motives. The person who slays an enemy in revenge for wrongs done, a youth who kills his father before he gets decrepit in order to enable him to continue a vigorous life in the world to come, a father who kills his child as a sacrifice for the welfare of his people, act from such entirely different motives, that psychologically a comparison of their activities does not seem permissible. It would seem much more proper to compare the murder of an enemy in revenge, with destruction of his property for the same purpose, or to compare the sacrifice of a child on behalf of the tribe with any other action performed on account of strong altruistic motives, than to base our comparison on the common concept of murder.

Similar observations may also be made in the domain of art. The artist who tries to display his skill in handling his material will be led to æsthetic results. Another one, who wishes to imitate certain forms in his work, may be led to similar results. Notwithstanding similarity of results, the psychological processes in these two cases are quite distinct and not comparable.

For these reasons it seems to me that one of the fundamental points to be borne in mind in the development of anthropological psychology is the necessity of looking for the

common psychological features, not in the outward similarities of ethnic phenomena, but in the similarity of psychological processes so far as these can be observed or inferred.

Let us next consider in what direction the psychological problems of anthropology have to be looked for. I must confine myself here to a very few examples of what seem to me fundamental psychological facts.

One of the most striking features in the thoughts of primitive people is the peculiar manner in which concepts that appear to us alike and related are separated and re-arranged. According to our views the constituting elements of the heavens and of the weather are all inanimate objects; but to the mind of primitive man they appear to belong to the organic world. The dividing-line between man and animal is not sharply drawn. What seem to us conditions of an object—like health and sickness—are considered by him as independent realities. In short, the whole classification of experience among mankind living in different forms of society follows entirely distinct lines. I believe this subject can be made clear most easily by a comparison with a similar phenomenon in languages.

If the whole mass of concepts, with all their variants, were expressed in language by entirely heterogeneous and unrelated sound complexes, a condition would arise in which closely related ideas would not show their relationship by the corresponding relationship of their phonetic signs. An infinitely large number of distinct sound complexes—in other words, of distinct words—would be required for expression. If this were the case, the association between an idea and its representative sound complex would not become sufficiently stable to be reproduced automatically at any given moment, without reflecting. The automatic and rapid use of language has brought it about that the infinitely large number of ideas have been reduced by classification to a lesser number, which by constant use have established firm associations, and which can be used automatically. It seems important to emphasize the fact that the groups of ideas expressed by specific words show very material differences in different languages, and do not conform by any means to the same principles of classification. To take the example of English. We find that the idea of water is expressed in a great variety of forms. One term serves to express water as a liquid; another one, water in the form of a large expanse, a lake; others, water as running in a large body or in a small body, a river and brook. Still other terms express water in the forms of rain, dew, wave, and foam. It is perfectly conceivable that this variety of ideas, each of which is expressed by a single independent term in English, might be expressed in other lan-

guages by derivations from the same term. It seems fairly evident that the selection of simple terms must to a certain extent depend upon the chief interests of a people; and where it is necessary to distinguish a certain phenomenon in many varieties, which in the life of a people play each an entirely independent rôle, many independent words may develop, while in other cases modifications of a single term may suffice. In the same way as concepts are classified and groups of perceptions are expressed by a single term, relations between perceptions are also classified. The behavior of primitive man makes it perfectly clear that all these linguistic classes have never risen into consciousness, and that consequently their origin must be sought not in rational, but in entirely unconscious processes of the mind. They must be due to a grouping of sense impressions and of concepts which is not in any sense of the term voluntary, but which develops from entirely different psychological causes. It is a characteristic of linguistic classifications that they never rise into consciousness, while other classifications, although the same unconscious origin prevails, often do rise into consciousness. It seems very plausible, for instance, that the fundamental religious notions, like the idea of will power immanent in inanimate objects, or the anthropomorphic character of animals, are in their origin just as little conscious as the fundamental ideas of language. While, however, the use of language is so automatic that the opportunity never arises for the fundamental notions to emerge into consciousness, this happens very frequently in all phenomena relating to religion.

I believe that anthropological investigations carried on from this point of view offer a fruitful field of inquiry. The primary object of these researches would be the determination of the fundamental categories under which phenomena are classified by man in various stages of culture. Differences of this kind appear very clearly in the domain of certain simple sense-perceptions. For instance, it has been observed that colors are classified according to their similarities in quite distinct groups without any accompanying difference in the ability to differentiate shades of color. What we call green and blue are often combined under some such term as "gall-like color," or yellow and green are combined into one concept, which may be named "young-leaves color." The importance of the fact that in thought and in speech these color-names convey the impression of quite different groups of sensations can hardly be over-rated.

Another group of categories that promise a field of fruitful investigation are those of object and attribute. The concepts of primitive man make it quite clear that the classes of ideas

which we consider as attributes are often considered as independent objects. The best-known case of this kind, one to which I have referred incidentally before, is that of sickness. While we consider sickness as a condition of an organism, it is believed by primitive man, and even by many members of our own society, to be an object which may enter the body, and which may be removed. This is exemplified by the numerous cases in which a disease is extracted from the body by sucking or by other processes, in the belief that it may be thrown into people, or that it may be enclosed in wood in order to prevent its return. Other qualities are treated in the same way. Thus the condition of hunger, exhaustion, and similar bodily feelings, are considered by certain primitive tribes as independent objects which affect the body. Even life is believed to be a material object that may become separated from the body. The luminosity of the sun is considered as an object that the Sun himself may put on or lay aside.

I have indicated before that the concept of anthropomorphism seems to be one of the important categories underlying primitive thought. It would seem that the power of motion of the self and the power of motion of an object have led to the inclusion of man and movable objects in the same category, with the consequent imputation of human qualities to the moving objective world.

While in many cases we can see with a fair degree of clearness the fundamental concepts underlying these categories, in other cases these are not by any means clear. Thus the concept of incest groups—those groups in which intermarriage is strictly forbidden—is omnipresent. But no satisfactory explanation has so far been given for the tendency to combine certain degrees of blood relationship under this view-point.

Much material for this field of inquiry is contained in the works on comparative anthropology, but I believe a more thorough psychological analysis of the accumulated data may reveal important new information.

We will now turn to the consideration of another group of psychological phenomena that seem to me of considerable importance. In all forms of society certain groups of activities and of thoughts appear in certain typical associations. Thus in our modern society the consideration of cosmic phenomena is constantly associated with the efforts to give adequate explanations for them, based on the principle of causality. In primitive society the consideration of the same phenomena leads to a number of typical associations which differ from our own, but which occur with remarkable regularity among tribes living in the most remote parts of the world. An excellent instance of this kind is the regular association of obser-

vations relating to cosmic phenomena with purely human happenings; in other words, the occurrence of nature myths. It seems to my mind that the characteristic trait of nature myths is the association between the observed cosmic events and what might be called a novelistic plot based on the form of social life with which people are familiar. The plot as such might as well develop among the peoples themselves; but its association with the heavenly bodies, the thunder-storm, or the wind, makes it a nature myth. The distinction between the folk-tale and the nature myth lies solely in the association of the latter with cosmic phenomena. This association does not naturally develop in modern society. If it is still found every now and then, it is based on the survival of the traditional nature myth. In primitive society, on the other hand, it is found constantly. The investigation of the reason for this association is an attractive problem, the solution of which can only in part be surmised.

A number of other examples will demonstrate that the kind of association here referred to is quite common in primitive life. An excellent instance is furnished by certain characteristics of primitive decorative art. With us almost the sole object of decorative art is æsthetic. We wish to beautify the objects that are decorated. We recognize a certain appropriateness of decorative motives in accordance with the uses to which objects are to be put, and the emotional effect of the decorative motive. In primitive life the conditions are quite different. Extended investigations on decorative art in all continents have proved that practically everywhere the decorative design is associated with a certain symbolic significance. There is hardly a case known where a primitive tribe cannot give some sort of explanation for the designs they use. In some cases the symbolic significance may be exceedingly weak, but ordinarily it is highly developed. The triangular and quadrangular designs of our Plains Indians, for instance, almost always convey definite symbolic meanings. They may be records of warlike deeds, they may be prayers, or they may in some way convey other ideas relating to the supernatural. It would almost seem that among primitive tribes decorative art for its own sake does not exist. The only analogies in modern decorative art are such as the use of the flag, of the cross, or of emblems of secret societies, for decorative purposes; but their frequency is insignificant as compared to the general symbolic tendencies of primitive art. Thus it will be seen that we have here again a type of association in primitive society quite different from the type of association found among ourselves. Among primitive people the æsthetic motive is combined with the symbolic,

while in modern life the æsthetic motive is either quite independent, or associated with utilitarian ideas.

I will give still another example of a form of association characteristic of primitive society. In modern society, social organization, including the grouping of families, is essentially based on blood relationship and on the social functions performed by each individual. Except in so far as the Church concerns itself with birth, marriage, and death, there is no connection between social organization and religious belief. These conditions are quite different in primitive society, where we find an inextricable association of ideas and customs relating to society and to religion. I have referred before to the phenomena of totemism, which are perhaps the best example of this type of association. Totemism is found among many American tribes, as well as in Australia, Melanesia, and in Africa. I have described before its characteristic trait, which consists in supernatural connection that is believed to exist between a certain class of objects, generally animals, and a certain social group. Further analysis shows very clearly that one of the underlying ideas of totemism is the existence of definite groups of man that are not allowed to intermarry, and that the limitations of these groups are determined by considerations of blood relationship. The religious ideas found in totemism refer to the personal relation of man to certain classes of supernatural powers, and the typical trait of totemism is the association of certain kinds of supernatural power with certain social groups. Psychologically, therefore, we may compare totemism with those familiar forms of society in which certain social classes claim privileges by the grace of God, or where the patron saint of a community favors its members with his protection. It will be recognized that we have here again a type of association in primitive society which has completely changed with the development of civilization.

We will now turn to the consideration of a third point, to the peculiar importance of automatic actions in the development of the customs and beliefs of mankind. It is a well-known fact that all those actions which we perform with great frequency are liable to become automatic; that is to say, that their performance is ordinarily not combined with any degree of consciousness. Consequently the emotional value of these actions is also very slight. It is, however, remarkable that the more automatic an action, the more difficult it is to perform the opposite action; that it requires a very strong effort to do so; and that ordinarily the opposite action is accompanied by strong feelings of displeasure. It may also be observed that to see the unusual action performed by another person excites the strongest attention and causes feelings

of displeasure. An example will make clear what I mean. When we consider our table manners, it will readily be recognized that most of them are purely traditional and cannot be given any adequate explanation. Still the constant performance of the actions which constitute good table manners makes it practically impossible for us to act otherwise. An attempt to act differently would not only be difficult on account of the lack of adjustment of muscular motions, but also on account of the strong emotional resistance that we should have to overcome. To eat with people having table manners different from our own seems to us decidedly objectionable and causes feelings of displeasure which may rise to such intensity as to cause qualmishness. Another good example is the feeling connected with acts that in our society are considered as modest or immodest. Every one will feel instinctively the strong resistance that he would have to overcome, even in a different society, if he were required to perform an action that we are accustomed to consider as immodest, and the feelings that would be excited in his mind if he were thrown into a society in which the standards of modesty differed from our own. It seems to my mind that these feelings of displeasure exert a very strong influence upon the development and conservation of customs. The young child in whom the habitual behavior of his surroundings has not yet developed will acquire much of this behavior by unconscious imitation. In many cases, however, it will act in a way different from the customary behavior, and will be corrected by its elders. This is presumably one of the most important elements that tend to bring customary behavior into the consciousness of the people practising it. When educating their children to conform to the tribal standards, these standards must necessarily become conscious to the educators.

One of the cases in which the development of ideas based on behavior is best traced, is that of the taboo. Although we ourselves have hardly any definite taboos, to an outsider our failure to use certain animals for food might easily appear from this point of view. Supposing an individual accustomed to eating dogs should inquire among us for the reason why we do not eat dogs, we could only reply that it is not customary; and he would be justified in saying that dogs are tabooed among us, just as much as we are justified in speaking of taboos among primitive people. There are a number of cases in which it is at least conceivable that the older customs of a people, under a new surrounding, develop into taboos. I think, for instance, that it is very likely that the Eskimo taboo forbidding the use of caribou and of seal on the same day may be due to the alternating inland and coast life of the people. When they hunt inland, they have no seals, and consequently can eat only

caribou. When they hunt on the coast, they have no caribou, and consequently can eat only seal. The simple fact that in one season only caribou can be eaten, and that in another season only seal can be eaten, may have easily led to a resistance to a change of this custom; so that from the simple fact that for a long period the two kinds of meat could not be eaten at the same time developed the law that the two kinds of meat must not be eaten at the same time. I think it is also likely that the fish taboo of some of our Southwestern tribes may be due to the fact that the tribes lived for a long time in a region where no fish was available, and that the impossibility of obtaining fish developed into the custom of not eating fish.

It would seem, therefore, that we may say in a general way that the customary action is the ethical action, that a breach of custom is everywhere considered as essentially unethical.

It is very likely that the same causes have had a strong influence upon the development of local conventional styles of art. It is no less true that the customary form is liable to be considered the beautiful form than that the customary behavior is considered ethical behavior. Therefore the stability of primitive styles of art may ultimately be due to the same causes as the stability of primitive customs.

If the origin of concepts and of distinct types of association is such as I suggested to-day, and if the existence of these concepts and types of association is brought into the consciousness of primitive man by the incidents of his daily life, when customary concepts and customary associations seem to be broken, we recognize that man must in a great many cases find himself confronted with the fact that certain ideas exist in his mind for which he cannot give any explanation except that they are there. The desire to understand one's own actions, and to get a clear insight into the secrets of the world, manifests itself at a very early time, and it is therefore not surprising that man in all stages of culture begins to speculate on the motives of his own actions.

As I have explained before, there can be no conscious motive for many of these, and for this reason the tendency develops to discover the motives that may determine our customary behavior. This is the reason why in all stages of culture customary actions are made the subject of secondary explanations that have nothing to do with their historical origin, but which are inferences based upon the general knowledge possessed by the people. I think the existence of such secondary interpretations of customary actions is one of the most important anthropological phenomena, and one which is hardly less common in our own society than in more primitive societies. It is a common observation that we desire or act

first, and then try to justify our desires and our actions. When, on account of our early bringing up, we act with a certain political party, most of us are not prompted by a clear conviction of the justice of the principles of our party, but we do so because we have been taught to respect it as the right party to which to belong. Then only do we justify our standpoint by trying to convince ourselves that these principles are the correct ones. Without reasoning of this kind, the stability and geographical distribution of political parties as well as of church denominations would be entirely unintelligible. A candid examination of our own minds convinces us that the average man in by far the majority of cases does not determine his actions by reasoning, but that he first acts, and then justifies or explains his acts by such secondary considerations as are current among us.

That the same conditions prevail to even a greater extent among primitive people can easily be shown by a number of examples. It has been pointed out before that decorative art among primitive people is almost everywhere symbolic. This does not preclude the possibility of designs, and even of the whole style, of one region being borrowed by the people of another region. This has been the case, for instance, among the tribes of our Northwestern Plains, who have borrowed much of their art from their more southern neighbors; but they have not adopted together with it the symbolical interpretations given by their neighbors, but invented interpretations of their own. I imagine that this is the outcome of a mental process which set in when the designs were found pleasing, and, according to the general character of primitive thought, a symbolic interpretation was expected. This was then secondarily invented in accordance with the ideas current among the tribe.

The same observation may be made in primitive mythology. The same kind of tales are current over enormous areas, but the mythological use to which they are put is locally quite different. Thus an ordinary adventure relating to the exploits of some animal may sometimes be made use of to explain some of its peculiar characteristics. At other times it may be made use of to explain certain customs, or even the origin of certain constellations in the sky. There is not the slightest doubt in my mind that the tale as such is older than its mythological significance. The characteristic feature of the development of the nature myth is, first, that the tale has associated itself with attempts to explain cosmic conditions—this has been referred to before—and, secondly, that when primitive man became conscious of the cosmic problem, he ransacked the entire field of his knowledge until he happened

to find something that could be fitted to the problem in question giving an explanation satisfactory to his mind. While the classification of concepts, the types of association, and the resistance to change of automatic acts, developed unconsciously, many of the secondary explanations are due to conscious reasoning.

In the preceding remarks I have tried to point out a direction in which anthropological data may be used to good advantage by the psychologist; that from a psychological point of view, the starting-point of our investigations must not be looked for in anthropological phenomena that happen to be alike in outward appearance, but that in many cases diverse phenomena are based on similar psychic processes, and that these offer to the investigator a promising line of attack.

THE DYNAMIC INTERPRETATION OF DEMENTIA PRÆCOX¹

By ADOLF MEYER

Up to recent years the ambition of scientific medicine was to trace all morbid conditions to some kind of anatomical lesion. This inevitably left a large field in which there was 'no pathology as yet,' and therefore a suspicion of inevitable chaos. The trend of the last decade and the experience with biological serum-reactions and especially also the progress of psychiatry has, however, greatly strengthened a *functional* and *biological* view of the events in living beings, so that the work of *pathology* appears to us primarily as the *determination of causal chains or conditions with the accuracy of an experiment*, and the lesions then take their place among the simple facts or symptoms, according to the extent to which they can be understood in terms of dynamic developments, *i. e.*, of cause (or conditions) and effect.

This functional way of seeing things has the great advantage of allowing us to arrange the facts as we see them.

Most attempts at translation of the functional facts into neurological homologies leave out the actual amount and duration of the function, and the all-important laws of compatibility and incompatibility of sequences, and the discrimination between what are *moving factors* or more decorative staging or incidents. Turning to the functional and dynamic conceptions allows us to remain true to neurological conceptions where we are entitled to any and yet to take in the entire psychological setting without which the events would be difficult to grasp, artificial and devoid of the spark of life and interest to most physicians.

The dynamic conception which I shall present in this lecture is not *new* in one sense, but in another it *reconquers* and makes safe the ground of common-sense psychology abandoned by medicine during the struggle against superstitions and also under the influence of philosophical speculations, now become indispensable again if we wish to bring differentiation into our field and account for, and explain, the

¹Lecture delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909.

events constituting mental disorders. I have been said to resurrect the layman's opinion of the causes and nature of mental disease. I grant that to some extent; but we are also adding the *conditions* and critical safeguards under which we are justified in accepting and pursuing our normal instinctive interpretations.

Among mental diseases certain chains of events recur with such regularity that they become valuable clinical units or reaction-types.¹ When the development appears natural and plausible we consider the disorder accounted for and, under certain conditions, explained. In this respect, we find for instance that the so-called organic dementias are accounted for and to some extent explained by the extent and kind of brain disease, determination of which tells us what the symptoms and the development must have been or would probably be. In a more functional field, we find the deliria of intoxication, perhaps not explained, but empirically accounted for by a sufficient amount of intoxicant material *and* personal disposition. In a second place we may rank certain depressions and excitements and paranoic developments of which we may say that they come nearer and nearer being both explained and accounted for psycho-biologically; when we have all the facts, they are apt to rank fairly plainly as exaggerations of relatively normal reactions, as is the case with many depressions and delusional states. In a third place there are, however, disorders which seem to defy both explanation and accounting for; among these figure, according to the claims of many physicians, certain disorders prominent in the *dementia præcox* group. In order to be on concrete ground, I shall now briefly state a few of the types to be compared and discussed; and in view of the fact that we have with us the most fruitful workers on the problems of detail, I have chosen to limit myself especially to the broader settings in cases which anybody can find and study and form his own impressions and estimates on.

The following sketches form the material of our discussion :

A young man said to have been bright at school and in his early environment is transplanted from the South to New York at 22 (1903), fails to make friends, becomes morose and morbid and seclusive, especially after finally losing his position (Christmas, 1904); he resorts to quack-treatment for sexual neurasthenia, and finally goes to a general hospital with vague complaints of general weakness (Spring of 1905). Then, at home for six weeks, he showed *more* seclusiveness, was noticed to smile and talk to himself in an unexplained manner, imagined he was followed, in other words had the feeling of being at a disadvantage, and of mistrust and day-dream-like reac-

¹*The Psychological Bulletin*, Vol. V, No. 8, p. 245. The Problems of Mental Reaction-types, Mental Causes and Diseases.

tions, not clearly sized up by the family, until May 31, 1905, after a restless and probably sleepless night, a tantrum precipitated the recognition of the condition. The young man came to breakfast unkempt, ate, then suddenly got up, shook hands with his mother, said she was the best mother he ever had and announced: 'Between you and me and E (sister) I am going to be President of the United States.' The mother was (probably quite unnecessarily) frightened, he tried to hold her; she escaped and he then shouted and broke up the furniture and the chandelier. When he came to the hospital he regretted the violence, said he did not know at the time what he was doing; 'It seemed like a feeling took control of me.' He remembered it all clearly, and added that at times he felt as if *somebody* was taking something out of him when they spoke, 'some of my mind, my intellect, my power'—feelings and judgments very characteristic of this type of dissociation of the personality. At the hospital he was able to occupy himself for a while but gradually grew more irritable and offish, more and more dull and finally passed into a classical negativistic stupor (with catalepsy, refusal of food and mutism) from which he rose to some extent in the course of a few years, but with decided dilapidation, gross indifference, tendency to lounging about, with an occasional semblance of distractibility and flight of talk, but absence of any spontaneous push or interests—a classical instance of terminal dementia.

Heredity is denied in this case. Early masturbation stands in the centre of a distinct bias; circumstances and this bias encouraged solitude, hypochondriacal ruminations, feelings of disadvantage, neglect of himself, a shirking of the usual balancing helps offered by the common habits of social and practical life of the environment; then came more positively morbid reactions: mistrust, ideas of being followed, and silent mulling over thoughts never brought to any control by action, or even to simple open ventilation, as shown in the smiling and muttering to himself. Of this long period we only know the further frustration of interest in even the ordinary personal attentions and ambitions, and a peculiar notion that the doctor and nurses stole his soul (probably an imagination partly based on the feeling of disadvantage in comparisons of his empty state with the healthy, vigorous and superior persons with whom he had forced and otherwise dodged contact), and the episodes of probably very empty compensatory pleasurable moods of mere smiles, and mutterings of matters enjoyed by himself but probably less and less fit to be spoken out, less likely to stand the criticism that comes to outspoken words and to stimulate desire for communication. Finally we see the culmination in a sleepless night, and the tantrum at breakfast which felt like a discharge of tension, forced, 'like a feeling took hold' of him, an action by something not quite himself, and in it a characteristic rise to a *contrast* and *compensation* where concrete life brought nothing but failures; and finally a complete avoidance of the trial method which might have balanced his ruminations. Then comes further evidence of queer interferences of thought; some of his mind, his intellect, his power was taken from him—a very frequent interpretation of defect of integration, of blocking and of interferences felt in these states of insufficiency and incongruity of thought and action. Finally there is the development of a most protracted and biologically elementary shrinking into himself with the classical catatonic stupor in which the patient is a mere bundle of tense inactive self-defense, and, after the relaxation of the tension, an emersion of only the most inferior residuals of his interests and stock of endowment and training—a scattered, dilapidated condition rather than

an elementary dementia; inadequacy of emotions and interests and corresponding superficiality and reduction of volition and activity.

I pass over a similar case in which I originally (1905) formulated the evolution of the psychoses in terms of habit-conflicts which shows even more clearly the curve of transformation: masturbation from 9; decline of efficiency at school from 11, at the same time desire to become a teacher, mainly on account of the neatness of dress; frequent headache; two attempts at outside employment, then retired and rather secluded existence at home, excessive shame over the development of a small patch of gray hair; headaches and sleepiness in the morning; later ideas of having a tape worm; an operation for hemorrhoids at 21, with fear that her rectum would close up; then amenorrhœa with worry over her sexual misdeeds; futile attempts to make a better start; she bought paper and pens to become a book-keeper, but never got further; she would insist that she was a 'good girl'; she began to sleep poorly, became afraid at night, and at a party she complained that everybody looked at her. Then came a peculiar religious zeal; she poured kerosene oil on the steps for holy water; she ran to church at midnight; at Bellevue hospital she said—'I hear angels telling me how to pray when I lose my thought'—evidently a happy interpretation of the blocking and feeling of automatism; she scalded her right arm to save the world, soiled herself ('I had to be once more a baby'), developed a peculiar religious-symbolic talk and attitude, but times with senseless moralizing and ecclesiastic utterances with an undercurrent of salvation achieved or longed for, for herself and the world, and passed into a semi-ecstatic catatonic stupor which relaxed after a few years but left the patient in an apathetic so-called 'terminal' state, in the absence of any adequate balancing material before the attack. Again habit conflicts, gradual decline of efficiency balanced by empty ambitions, a series of incomplete attempts to rise, seclusion, hypochondriasis, finally a religious-fantastic compensation of catatonic form and lack of reintegration.

Another type in which the element of tension did not enter in the same manner is that of a young woman stenographer, committed at the age of 21, the child of a thriftless father, and sister of a young man who passed through a transitory mental upset at 20, and two relapses since; the patient had spent several years at a protectory, was bright in her studies, took up dressmaking and shortly after stenography and typewriting. She became, however, indifferent and lazy, remained in bed as late as possible in the morning. She became discontented at home, induced her mother to move into apartments beyond their means and asked her for money to take dancing lessons to go on the stage. October, 1906, she was dismissed from her position because of tardiness in reaching the office. She did not care, tried other positions but could not hold them. When in April, 1907, her brother was sent to a hospital, she became very seclusive, did not leave the house except for business or church. She said later that at that time she learned that her brother masturbated. She read more and more theatrical journals and romantic stories, bought peroxide to bleach her hair, and a preparation to remove the hair from her arms. During the summer of 1907 she spoke occasionally of a young Jew in the office paying attention to her. One night she awakened from a dream screaming; she told her mother that the day before, this young man had put his arms around her neck. She got impure thoughts, confessed having long indulged in masturbation; she admitted that she had thought of this young man in her dream. She gave up her position, feared the men would see her shame in her eyes. Her mother then noticed that her mouth and nose twitched in a peculiar way,

she appeared depressed, threatened to end her life; she was taken to a general hospital where she remained four days and was then transferred to Bellevue and finally to our service.

On admission the patient was quiet, spoke in a subdued voice; at times her expression was rather anxious but she could be easily induced to smile; there was much twitching of the upper lip with dilatation of the nostrils, and quivering of the brow muscles; she did not seem to be afraid yet she uttered many apprehensive ideas and expressed much fantastic horror over the surroundings, asked if they would choke her and bind her down or put her in a cage and make her walk on all-fours. She talked quite freely and often complained of her mind wandering; of inability to concentrate, used many but half-understood words, and remarked that she was not talking connectedly. She referred the talk of other patients to herself and spoke many times of hearing voices. When the nurse rattled her keys, she remarked: "I hear chains—I know I was blind and my brain is turned at the present moment." When asked what her difficulty was she said: "The thing that is uppermost in my mind is a fear that my mother and my brother will go insane if I die—if I—if I am fumigated—this isn't a very connected speech is it?" When asked to explain what she meant by fumigated she remarked: "It means burned up, don't it and thrown to the four winds—you are writing down all I say." When she heard some patients talking in the sitting hall she remarked: "Is n't that terrible those voices out there—that woman is saying I am insane—after this she will punish me—do something terrible to me—put me in a cage and I will have no shame left."

She told of the young man in the office who had put his arms around her and said that later she had a dream in which this young man tried to 'hurt' her; she resisted; after that she had the idea that the young man knew what she had dreamt about. Before she had the dream she had seen this young man make lewd motions and he had winked at her. She thought she had ruined herself by masturbation—"I was ashamed to look at any man—I thought they saw what I had done in my eyes."

The patient was clear as to her whereabouts and her memory was good: she did calculations correctly and promptly.

Her general physical condition was good; she was menstruating when admitted.

Following her admission she was languid, expressed many apprehensive ideas, but did not appear to be in any fear; she complained a great deal of hearing voices, but it was difficult to get her to specify what she heard. She continued to complain that her mind wandered, things were mixed up, she could not concentrate and admitted that bad thoughts kept coming into her mind. Once she asked the physician: "Can't you throw something on me like water to wake me up—I don't know if I am dreaming or not—I used to be tidy but now I am horrible, I don't take care of my person any more." Another time she asked: "Am I crazy, will I ever get over this?" When questioned she was inclined to cover her face, she wished to avoid the physician and expressed feelings of shame.

She was able to do the thinking tests without any special difficulty, grasped the point of what she read fairly readily, but occasionally she gave rather peculiar answers when questioned about her school knowledge and her thoughts at times seemed to be quite scattered.

While in her general demeanor she appeared dejected she never spoke of being sad and she frequently smiled even when uttering anxious ideas—*e. g.*, she remarked with a smile: "I am afraid of being killed." She complained a great deal of feeling strangely, she talked

of shocks of electricity going through her body and of little strings running through her skin; very often she referred to such ideas as 'imagination.' She spoke of talk from inside of her body, voices making lewd suggestions in regard to Christ; she was afraid to repeat what she heard fearing that she would go to hell. She also heard voices from the outside, they told her she would drop dead; she thought it must be wireless telegraphy. She said in regard to the voices—"my brain seems to turn with them, I have no will power."

After a month in the hospital she had become extremely languid and apathetic; notwithstanding continued efforts to gain her interest and to crowd out the ruminative lapses she could not be induced to occupy herself in any way and was very careless about her appearance. Frequently she would throw herself on the floor, whimper and talk of dying. She explained this as a reaction to voices which suggested that she should drop dead. Once she referred to her behavior in Bellevue: "I was very violent and I thought I was Jesus—I jumped on the radiator and sang, thought I was a bird and a parrot." Once she suddenly sprang up from her chair and said that people downstairs were pulling strings; another time she was seen standing by the table running her fingers along the edges; when asked to explain this she said: "*It's all braining.*"

During November, 1907, the patient appeared a little brighter, but she was still extremely languid, listless and apathetic; she expressed many strange ideas and peculiar feelings—*e. g.*, "It seems that people get possession of me in some way through my ears." When asked what she was occupied with she replied: "Something twisted my brain—these people that walk around talk with their feet—my brains have floated down my back" (smiling). When asked if her thoughts were connected she replied: "No, they fly around as though they go out of my ears and float."

Once during the interview she suddenly began to moan, breathed deeply and put her head down on the table. When asked to explain this behavior she said that she felt something in her cheek like 'meat' and thought she heard a young man's name mentioned, a butcher whom she had previously been interested in.

At a later occasion she gave a long statement difficult to understand except as a mixture of reminiscence and sexual symbolism. At present she is largely absorbed by her scattered ruminations, with excessive and forced play of her features. She does not utter her dream-life above a whisper, and in fragments; is unapproachable, and only rises to the level of communication in asking for her hat to go home to her mother, giving the correct address.

Here hereditary deficiency, deterioration of concrete interests with ill-founded and ill-directed aims, and a total missing of her level, with early masturbation and sexual ruminations and poorly controlled ambitions, led away from concrete productivity and from the checks and props of helpful environment and finally to a break of compensation in a sexual experience and a dream, and ideas that men could see her shame, then a pseudo-compensation by fantastic and partly dissociated or hallucinatory (disowned) ruminations in the form of voices and thoughts of uncontrollable and lewd contents, at the same time with queer feelings about her brain, growing preponderance of stilted words, facial expression with exaggerated grimaces and twitches, discrepancy of mood and thought (laughing when saying that she was afraid of being killed), and a gradual crowding out of the normal thinking and grasp on facts and tendencies by the wholly demoralized gushes of fancy and mental self-abuse. No interests to which to appeal;—progressive deterioration.

While *these* disorders are mainly examples of a gradual and diffuse *deterioration of concrete interests*, the following case presents a striking evolution of a side-tracked complex of specific *longings* to the point of a compensatory fulfillment. A Jewess free of heredity, of rather perverse and stubborn disposition and with outbursts of temper as a child, became an efficient dressmaker, married at 23 a rather inferior man, and was an excellent and efficient wife but excessively jealous. She was crazy for children, but remained sterile. Treatment in 1892 and again 1902 availed nothing; 1902, when run down from a septic infection of the hand, she was told she could never have any children and was greatly upset. She was then subject to vivid *dreams* in which she was attacked. A few months later, a physician suggested an operation for uterine tumor, but she made a scene, called him a bandit and a murderer. Soon after that she began to disclose that she was sure the physician who treated her in 1892 had removed a child from her as she 'was then pregnant.' She said she had seen her boy in the park, asked newsboys to find her Benny, and finally upbraided a physician for *keeping* her child for experimental purposes and was arrested. At the hospital she repeated these fancies in a perfectly orderly fashion, gradually began to promise to let the matter drop and in two months she was taken home. Three months later she resumed her accusations, claimed she was being operated on every night, that doctors damaged her brain away; the papers pictured her as the mother of imagination. She was returned, thought she was pregnant, had nocturnal hallucinatory experiences, spoke of conspiracy, and said the nurses went with her husband. Operative removal of the uterine fibroid had no effect. Gradually the number of her imaginary children grew to ten and more. The husband was declared to have become a millionaire through the money the doctors had given him for the opportunity of experimentation. She again learned to smooth over her ideas, but after a few months at home she returned as daughter of the Queen of Russia, with elaborate systematizations. She is a good worker in the sewing room, discusses her situation pleasantly and coherently if tactfully treated, still asserts that she is pregnant—a typical paranoid compensatory wish-fulfillment, gradually attained after a period of dream experiences uncorrected in her waking life.

From these grave cases many transitions lead over to those in which we see mainly episodic tantrums break through, usually in the form of conflicts, or of wish fulfillments with varying elaboration within the situation, and a number of more or less characteristic traits that mark the disorders as reactions to complexes, faulty and perverted attempts to meet more or less real difficulties and breaks of integration. The chief point is that concrete difficulties and states of tension can be demonstrated and that the course shows a distinct relation between balancing material and further evolution.

We should have to refer further to those cases in which as a rule definite strings of developments appear in a person either originally with difficulties of make-up, or transformed or made unresistive through progressively deteriorating habits of adjustment.

Another case is that of a bright young woman who went through nine months of a catatonic attack with a delirious episode, negativism,

refusal of food, retention of saliva, stereotyped attitudes, echolalia, grimacing, etc.; improved at the end of nine months, went home almost well, but in a few months became sleepless, harped bitterly about fantastic ill-treatment at the first hospital to which she had been taken, again refused food, complained of pain in the left shoulder, improved slowly at the hospital, was again better and might have gone home if the circumstances had permitted; then got worse again and says now, she has no touch with her real environment; her mind dwells on the old story of ill-treatment and she hears remarks on it; she is made to suffer here for another woman; she had refused work for months out of a feeling of aversion and disappointment when transferred to a ward for more chronic patients, but even here was again found at work and much more affable after a review of her situation. Yet this woman is, through fate and the development of her make-up, relegated to the ranks of disappointments of treatment.

Good informants saw nothing peculiar in her and called her efficient, practical, not dreamy. On closer inquiry she was described as very scrupulous about the feelings of others, and equally sensitive to slights, proud of her appearance and reputation, so prudish that she would never undress in the presence of her sister and unusually sensitive about references to sexual matters. She had times when she wanted to be alone and felt nervous and complained of weakness and stomach troubles. Her father had died insane; and a brother (one of five) had had epileptic insanity. The patient herself complains that she *never* was practical; she was a great reader and her sister tells us of a huge scrap book of poetry. From 1905-07 she stayed away from confession. A young woman against whom her sister had warned her, introduced a man to her concerning whom she first spoke with aversion, but who evidently fascinated her under a decided conflict. She was much mortified because she found out that he was a divorced protestant and he left her after having hurt her shoulder by lifting her up playfully, and after borrowing some money. This was followed by another blunder and conflict; although deeply averse to divorces, the patient helped a young woman get evidence for a divorce from a supposed bigamist, worked all her spare time and found out in the end that there had not been any marriage at all. This was followed by her moving to another city; there the conflict preyed on her and a depression came on which rapidly led to a catatonic climax, without the slightest attempt at rapport on the part of the patient or physician, until she was transferred to another hospital and finally discharged after an illness of nine months. The pain in the shoulder which had recurred when she came to us disappeared after an electrical examination of the really existing slight atrophy. The details of the development and the reminiscences from the first hospital were then gone into, but evidently not traced completely to a balance or to the fundamental sore points. The circumstances of her family and the crowding of the hospital necessitated compromises to which she reacted unfavorably several times after a certain level was reached; she relapsed and got out of touch with her real environment. She says distinctly—'my mind is always away from here.' Yet the adjustments in changing the mere ruminations into open discussion and giving space for direct and concrete interests has an unmistakable influence on the patient.

As a purely transitory disorder but with a host of 'pseudo-spontaneous experiences' and feelings of being *made* to do things, I should like to refer to a girl of 23 who made as it were a spontaneous recovery under mere quieting treatment and simple straightening out of the puzzle. Rather inefficient, unable to adjust her work and interests

smoothly, never holding her places as servant long, often sulky, shut-in, and with few friends, without any heredity and denying sexual abuse, the patient had become more self-absorbed about New Year, 1904; in March she had a short attack of articular rheumatism. After it she was even more self-absorbed, was sent on a vacation, after that began to offset the actual condition by claiming that her work was better, that the other girls made trouble and were jealous; at other times she remarked she had something terrible on her mind. An ultimatum about her inefficiency in November finally made her pass into a state in which she was odd, untidy, adding 'thank you' to everything she said, even to her sister. When a man came into the house she ran away, got on her knees and prayed. The next morning, after a few moments of normal manner, she had to be taken to the hospital and disclosed a whole complex of imaginative material, that a young man used to come to her room at night, that she felt she was pregnant, and then stopped feeling the movements; she must have conceived from a spirit, etc. She was run down, admitted dreaming much. Examination spoke against all possibility of her claims. But she described how the feeling developed, how her head felt queer, how she felt her head move, and her hands as if practicing the piano, but without *hearing* orders or voices or music. Even her work was at times forced on her in this pseudo-spontaneous way. One time she lost her speech for a few minutes although she could work her tongue. She gained rapidly, gradually became less apathetic and described the experience with full appreciation and employed herself. She was discharged restored in three months. It is not difficult to see in the whole experience a wish-conflict, traced to a man who lived in the house in the spring but who hardly ever spoke to her. The constitutional make-up with conflicts in her ordinary reactions, a certain amount of ill-health, frequent dreams and finally a tantrum, without the systematic amnesia of hysteria, gradually resolved again without complete ventilation of the entire mechanism. The observation dates from 1905. No catamnestic facts obtainable.

These sketches must suffice. They should show that they deal with developments far from being inconceivable as chains of faulty mental adjustment and far from demanding artificial explanations by specially invented poisons, and a clamoring for invented "things back of it all," if at least we acknowledge the long time and mass of doings and their kind.

These conditions have been grouped together by Kraepelin under the term *Dementia Præcox*, embracing derangements which very often tend to end in peculiar defect conditions, ranging from the not infrequent cases of simple disappointment of parental hopes by apparently promising individuals who fail to make their mark, to cases with rather characteristic mental upsets and characteristic usually progressive apathetic dementia.

These cases do indeed make a group worth distinguishing as a nosological entity and they offer certain common and characteristic traits always carrying a warning that the tendency is towards deterioration. The unfortunate feature of Kraepelin's view is that this possibility or great probability is made to appear as a great dogmatic certainty, dictated by

merely suggestive but not causally correlated signs which are seen in the end-stages and appear also in the very beginnings, as mere empirical ear-marks, merely classified as disorders of emotion and volition, hypothetically due to toxins and brain-lesions, but not reduced to any chain of cause and effect.

The picture as a *whole* makes the *diagnosis*. There are no decisively pathognomonic facts. The deterioration gives the disorder its name; but it need not always be realized; the essence of the process is a hypothetical toxic influence or disorder of metabolism—entirely hypothetical—with definite brain-lesions—also vague and not explained. What he deems essential comes out most clearly in his differential diagnoses, where we find the enumeration: emotional apathy, and specific disorders of will: negativism (mutism, refusal of food, etc.), automatism (catalepsy, echopraxia and echolalia) and mannerisms (grimaces, oddity, stereotypy, verbigeration), silliness, unaccountable and odd acts, etc.

This description, to a great extent taken over from Hecker and Kahlbaum, figured originally under the 'degenerative' disorders. There it would be a mere dispute about words to debate whether or not the early symptoms were evidence of the disease or not. The fact that these early signs *need* not lead to more trouble might still be compatible with calling them degenerative, and the mental factors *might* be admitted to play a more or less active rôle in the development of those cases which progressed further. But in 1896, Kraepelin, taking general paralysis as the paradigm of psychiatry—each disease having a definite etiology, definite course and outcome—included a much wider range of cases in the original group, viz., practically all cases of the simple psychoses which tend not to recover or are apt to deteriorate in the end; and he explained them all as disorders of autointoxication with a special assumed brain-disorder. Then the question might have arisen: If we deal with a toxic state where does it become established and when; and what would we have to modify to prevent it? What rôle do the biological reactions play which represent the early symptoms?

Kraepelin purposely declines any idea that special antecedents in the life of the patient are worth considering as causal or even as aggravating dynamic factors. About 20% would, according to him, show some early premonitory signs like seclusiveness, oddity, excessive religious devotion, moral instability, but trusting his *deus ex machina* he sees in this mere evidence of a very early setting-in of the so-called 'disease itself.' As a matter of fact the cases in which early symptoms *are* found are much more numerous than 20%; as I claimed in 1903, a very *large* number of these cases show what Hoch has

lately called a shut-in personality, specially exposed to inner friction,—a percentage of actual demonstration about as great as that of actual demonstration of evidence or suspicion of syphilis in general paresis. Kraepelin, however, underrated these facts and by absorbing many doubtful and poorly analyzed cases in his group came to suggest that this disease might befall any one, and that it was an autonomous brain-disease.

Even in the hands of the originators of this new large entity embracing all the cases passing into apathetic deterioration and many others that at least tended to deteriorate, the definition of the term is evidently much more fluctuating than the uncompromising theory would suggest. In Heidelberg it has fluctuated from 8% to 52%, and now back to 18% of all the admissions. In the Munich clinic the optimistic tendency is still more on the increase and fewer cases are dubbed dementia præcox on the female side than on the male side. The inevitable conclusion is that between dementia præcox and manic-depressive insanity and simple psychopathy there is an uncertain territory which refuses a categorical arrangement in the easy and simple dogmatic terms that 'some disorders *must* be a deteriorative brain-disease because they early present certain signs also seen in actually accomplished deteriorations' and the claim that it would be futile to make an effort to analyze the data as a whole in terms of cause and effect.

To this empirical and formal conception I have opposed for a number of years a conception which aimed to be less dogmatic and more likely to be conducive to the determination of the facts actually present in the cases in terms of an experiment of nature, in terms of determinable initial constellations, reactions with probabilities rather than fixed laws of termination; in terms of dynamic and possibly modifiable factors and in terms of natural non-dogmatic developments, to quite an extent measurable in advance by the facts at hand in the case and not merely by the intermediary of a dogmatic fate-like noumenon or largely hypothetical construction.

As dynamic factors in these developments there stand out certain activities and states of disturbed balance and regulations which have far-reaching effects upon the mental adjustments themselves, and *incidentally* upon the organic understructure of the personality.

We have so far failed to find any tangible poisons and infections as in any way essential in the process. The extent to which regulative substances akin to hormones may play a rôle and figure as non-mental short-cuts of reaction is a problem for the future to decide. Berkley's claim of hyperthyroidism is not very convincing to one familiar with a goitre-district and large numbers of thyroid affections; Kraepelin's suggestion

that the poison may have some relation to the sexual functions merely flirts with the truth and is so vague as to demand consideration only if actual facts can be adduced and other facts should fail.

On the other hand, we find in evidence factors which are apt to shape or undo a life—specific defects or disorders of balance, with special tendencies and *habitual* ways of bungling and substitutions and a special make-up which is liable to breakdown in specific manners.

In my first formulation of the situation in Toronto (*British Medical Journ.*, Sept., 1906), I started from the paradigm of *complete action* as the function which gets more and more disorganized by first trivial and harmless *subterfuges* or *substitutions* which, in some individuals, lead further, become harmful and uncontrollable, tend to assume types of definite anomalous mechanisms, unintelligible and crazy if viewed apart, but more or less intelligible as a string of actions substituting, and often missing, an efficient adjustment to concrete and actual difficulties.

These substitutions constitute the symptomatology and chains of events which we have found in the cases described and which I need not rehearse and analyze before you owing to the shortness of the time and because the facts in the cases described are more trustworthy than verbal formulas. Suffice it to say that we meet neurasthenia, hysteria or psychasthenia-like substitutions, or mere dilapidations of interests or states of conflict or depressions of a morose, *topical* character—usually with one or more initial tantrums of the character described,—and delusional developments either with episodes of ruminations and giggling and the like, which may absorb more and more of the patient's actual life, or catatonic developments, or paranoia-like delusional states, all with a number of ear-marks: in the main freedom of the hysterical haziness and tendency to systematic amnesia, but evidence of conflicts of reaction, of blocking, of peculiar automatic interferences, *i. e.*, evident disorders of the highest integrations, and fantastic ruts especially in the sexual or religious spheres and their symbolic elaborations, with very frequent dissociation of the personality and pseudo-spontaneous experiences; further, a growing divorce from the concrete environment, a deterioration of interests and perversion of impulses and actions.

I must pass over the systematic attempt to account for the various symptomatic mental and non-mental developments, as I am convinced that the complete account of the cases with their concrete settings and developments is bound to be the best and only safe basis for deductions, although I realize that the brevity of the sketches left untouched many legitimate

queries, especially those about the non-mental or so-called physical components of the reactions, and the possibility of accounting for them with habitual substitutions and habit-conflicts. I only wish to refer to the catatonic reactions which are especially often mentioned, not only as being oftenest connected with certain brain lesions, but as being unexplainable from the psychological side. The catatonic reaction is by no means so far from yielding to a psycho-biological interpretation. It is a breaking down of normal conduct and adaptation too closely related to what is seen in hypnotic states and in mystic fancies; too directly like stages in religious symbolism and feelings of submission to influences by mystic powers to be compared with what happens in organic psychoses. In general paralysis and arteriosclerosis and senile deterioration, it is not the *synthesis* into a personal integration that is *most* lacking, but the *material* used in the synthesis is decreasing, through lack of memory, judgment and the range of capacity, without any distinct following of the lines of functional cleavage in the process of disorganization. In dementia præcox the dissociations follow the lines of functional and topical complexes. The very frequency with which especially catatonic reactions appear outside of the actual deteriorations, though preferably in dementia præcox, would corroborate their interpretation as a specific functional reaction type possibly founded on a phylogenetically very old reaction partly of protection or partly of mystic surrender. If they are apt to appear occasionally in organic psychoses, the same holds for manic-depressive and other more essentially psychogenetic reactions. It is, however, certainly significant that catatonic disorders are *most* apt to accompany the *traumatic* forms of organic disorders, such as also produce hysterias and other after-effects most likely connected with a functional shock. In the simple *dilapidation* and the paranoic developments, the psychological staging is too much in keeping with the situation and the harmonious evolution on prevailing premises, to create serious doubt against an essentially functional interpretation of the evolution and, also, of the lesions which may be found.

Sizing up the disorder in terms of a break in the working of conflicts, of balance rather than in terms of an autonomous disease of the brain, will stand and fall with the extent to which the initial data allow us to predict the course of nature's experiment, a point concerning which only the publication of casuistic material will give sufficient proof. Our work with these principles warrants the conclusion that while general paralysis is *relatively* incalculable in the *details* of its course, and certainly remarkably *independent* of mental determinants, the fluctuations observable in dementia præcox are decidedly too of-

ten accounted for by renewed up-sets and tangles and irritation of idiosyncracies, and that the prognosis of the ultimate tendency is remarkably often foretold, so that of the cases interpreted as actual deteriorations but few surprise us with a recovery, and those that *do* recover are as a rule specified at the outset as cases merely akin to this group worth naming by the end-stage, but with varying amounts of balancing material. Such a disorder is, to be sure, as little open to *absolute* prediction as life's vicissitudes, and a continued test of estimates of events in the light of ultimate results gives one a certain reserve and modesty; but, with it all, the conviction grows that the factors depended on in the estimate of the make-up and in the ratio of the reaction and balancing material, are really *factors at work*, and leave less and less space to a craving for what is 'back of it,' instead of attention to what is the 'go.'

Where a break or morbid reaction has once set in, it is very difficult to bring relief directly. The fundamental shutting in and the whole mechanism enables the preoccupations to live themselves out and to exclude interference. Automatic resistance against the most natural impulses frustrate even the occasional pathetic spontaneous appeals of the patient for help. The best procedure is to tide over the acute tangle with as much tact and ease as possible, to promote relaxation, and to relieve the situation wherever that can be done, bearing in mind the facts obtained referring to the upsetting factors, the probable complex-constellations and prevailing physical disorders. As soon as the patients feel that they meet with help instead of an argumentative and corrective attitude they can be led considerably when the time comes or where the difficulty has not led to complete blocking. Then a positive re-education in the form of habit-training and of readjustment has to set in. It is obvious that experience brings a certain divination and that individual capacity plays a decided rôle in the straightening out of the difficulties, both during the tangles, and in ultimately marshalling the forces to a more practical unity and level again; it is also obvious that we cannot be very optimistic in most cases, as little as when we try to win over our less unbalanced neighbors to a better mode of thought, belief and conduct and behavior.

We owe to our European guests, Professor Freud and Dr. Jung, the demonstration that what is at work in the centre of the stage is a complex or group of complexes consisting of insufficiently balanced experiences in various ways modified by symbolism. Their ingenious interpretations have made possible a remarkable clearing up of many otherwise perplexing products of morbid fancy, in ways the discussion of which, no doubt, I had better leave to their lectures.

Yet, if I interpret their accounts correctly the reason why only few persons create these complexes and fewer yet develop them to a disastrous form and often to a deterioration, is mainly left to heredity or finally to toxins, whereas I would prefer to adhere to my attempt to define the responsible factors as far as possible in terms of prophylactic suggestiveness, in terms of untimely evocation of instincts and longings (acting as fatally as premature destruction of naïveté), and ensuing *habit-conflicts* with their effects on the balance of the person, and on the sum total of mental metabolism and actual doings and on the capacity for regulations in emergencies. In some cases the *habit-disorders* preponderate in the side-tracking and the curbing of leading interests and creation of disastrous substitutions; in others, definite complexes play a special rôle and as a rule the sizing up of the disposition must consider both factors. In practically all cases the scope and funds of mental deviation form a consistent evolution and offer the safest material for prognosis and practical handling.

For all I can see the main obstacle to a wider acceptance of a functional theory in terms of habit and complex conflicts and definite responses thereto, is on the one hand the habitual or intentional lack of the necessary penetration into the life of the patient and family, and on the other hand, the readiness of the physician to turn to set interpretations and to reiterate authoritative statements with a certain pedagogical self-sufficiency. I refer especially to the traditional rut shown by physicians when they have to meet the question of habit-disorders, such as masturbation, which invariably leads to reasoning in a circle by calling the disorder a symptom of a disease and evading the possible rôle in additional abnormal developments instead of to a frank inquiry into the facts and difficulties in the case. Further, there is perhaps also a more or less legitimate aversion to any extreme dogma, using too exclusively the sexual origin or the weight of complexes, and special displacement mechanisms, and an aversion to certain other 'atomistic' types of psychopathology, and especially also the fact that so many spontaneous recoveries occur and also many failures under almost any procedure.

The most serious cause for relapses into opposition to psychogenetic interpretations is the blind acceptance of any anatomical findings as definite evidence of an autonomous disease, after the paradigm of general paralysis. And to this point I wish to give a brief discussion.

The lesions found by Sioli and others are very different from those of general paralysis in their nature *and* as to autonomy of origin. They are most akin to fatty involution of the brain tissues, probably as incidental to the disorder of function as is

the brown atrophy of the heart, the fatty degeneration of muscles or of the liver. The one disease in which disorders similar to those in dementia præcox, and even more marked, have been seen, is Huntington's chorea which is a striking instance of familial insufficiency of the nervous system, and hardly a product of a toxic disorder. The occasional late recoveries of apparently demented patients and the peculiar clearing up of some cases during intercurrent diseases—in which the most *vital* instincts of self-preservation and of complex-free family interest are brought out again—would certainly make one doubtful about the “profound deteriorations of the cortex” being on an autonomous basis as in general paralysis. Until we know much more about the amoeboid neuroglia and the protagon degeneration seen in dementia præcox and in Huntington's chorea and probably elsewhere, we certainly do well to leave open the question whether a disorder of anabolism and catabolism incidental to the prolonged and often profoundly vitiated attitudes and defects of balance is not sufficient to explain the findings (which are possibly as incidental to special chronic disorders of function as the finding that Dr. Hodge has established in acute fatigue states), or to what extent they are perhaps short-circuits; that they are incidental to a broad frame, seems unshakable and the more we teach the physician to think in terms of what is demonstrable in the case, the better for him and for the patient and for prophylaxis and for the formulation of further problems of investigation.

The lesion in general paralysis is of a totally different kind, depending on a previous infection with syphilis and forming a peculiar infiltration of the brain vessels, similar to what happens in the African sleeping sickness, but accompanied by additional degenerative processes in the brain tissue. This exogenous disturbance leads to death within a limited number of years, and accounts for certain fundamental symptoms of dementia of a kind quite different from that in dementia præcox. In addition to that, there are, however, symptoms not common to all cases, such as the development of exaltations or depressions or delusional states, sometimes following certain traits of dementia præcox. These superadded psychotic symptoms have been attributed to different localizations or distribution of the characteristic lesions. A careful inquiry into this question on the material in the literature and our own observations of focal general paralysis shows, however, that the focal lesions may give aphasic attacks or neurological disturbances, and occasionally precipitate epileptiform reactions with amnesic phases, fugues, and states of bewilderment; but the psychotic symptom-complexes occur without any regularity. In one case of Alzheimer a dementia præcox-like disorder of

paranoid hallucinatory developments was connected with special affection of the left parieto-temporal region, but the patient had had an earlier attack six years before the suspicion of general paralysis arose. Such a case as this and a number of others suggest strongly that these *usually* psychogenetic disturbances depend more definitely on the previous mental make-up, even in the general paralytic, very much as has lately been admitted by Bonhoeffer and Homburger in certain alcoholic and exhaustive disorders—Homburger being a pupil of the Heidelberg school but under the influence of the master of functional pathology, Krehl.

In view of these considerations it is unintelligible that analogy with general paralysis could be strongly enough founded, to excuse a recent writer on the insane in Massachusetts who urges or sanctions on this ground a plea of medical ignorance with the following remarkable conclusion: "Until we have learned more by continuous study of the causation and pathology of dementia præcox, curative measures will be most fruitfully employed in the manic-depressive and toxic cases, to increase the percentage of recoveries and diminish the number of deaths."

The comfort of working under the cover of fatalistic and analyzed conceptions of heredity, degeneracy and mysterious brain-diseases—and the relief from responsibility concerning a real understanding of the conditions at hand, and concerning the avoidance of preventable developments—is a powerful and unconsciously cherished *protection*, very rudely disturbed by these conceptions which make the physician partly responsible for the plain and manageable facts. I deny that fatalism is inevitable, without admitting that my conception should imply unwarranted optimism. It is merely a return to the facts at hand which will prepare us all the better for the actual work, and pave the way towards prophylaxis where something can be done. The position is, however, equally important in the utilization in psychological teaching. There probably is a certain comfort in arranging the courses within a narrow range of laboratory problems. Unfortunately, that does not always train the student's sense in using the foot-rule of ordinary life with any degree of accuracy or conscience, when he passes to more complex domains. Scientific accuracy in one field does not guarantee a critical attitude in the fields of nature's experiments which are complex and cover larger spans. If we make the student wade through a mass of rather artificial psychological laboratory work, and on the other hand, equally artificial philosophical puzzles, we would leave him in the end without help and training to meet some essentials in life. Even a non-technical knowledge of the facts in some mental

patients is bound to widen the horizon and would to my mind be an intrinsic part of any course or programme of psychology (as good as, or better than, an abstract course on mind and body). Without its concrete lessons many events appear like puzzles and are unduly treated as such. This stands out glaringly in a recent book on psychotherapy which makes the reader divide the attitude of appreciation and the attitude of physical explanation without helping him to unite them again; which contrasts the subjective and objective and the purposive and the causal view without bringing them to the common denominator of experience again; which urges him to split psychiatry and psychotherapy—and therein fails to be helpful in the very task of sane instruction, namely, that of integrating disconnected facts into sane 'organized common-sense.' Familiarity with the concrete events in nature's experiments would reduce the longing for these artifacts.

I have on purpose avoided entering upon the details of many excellent modern trends of psychological investigation in our field. I wanted to make a plea for the broader *frame* of things. This frame must be grasped with an understanding of the broader elements in the disorders with which we deal. Within this frame the details get their perspectives. In the theory-ridden physician and in the ultra exact psychological laboratory worker, I should like to awaken the natural instinct of curiosity concerning the keenly interesting broader biological settings brought out by the mental disorders and destinies discussed. I should like to make all feel the sanctity and paramount interest of the concrete cases. I cannot resist recalling what is so well expressed in the recent Presidential address of the great physicist, J. J. Thomson, in his appeal to the mathematician to avail himself of the power of the concrete. He says: "Most of us need to tackle some definite difficulty before our minds develop whatever power they may possess;" and we cannot deny that the field of habit conflicts and of far-reaching and complex emotions and longings gets its most wonderful representatives in disease. Ribot opens his last study with the remark: "Le meilleur procédé d'expérimentation en psychologie, à mon avis, est la maladie avec ses désordres." Diseases are the most crucial experiments in man. Here the momentous things occur in a way which might well supplement the man-made experiments of our laboratories and suggest problems in a way which really go at the causal relationships vital to the student, vital to any layman who wants to know what psychology is and does, and vital to the physician who wants to help also where help would rarely come without him, and may even be too late with him, as long as we fail to make sure of prophylaxis.

We are, I believe, justified in directing our attention to the factors which we *see at work* in the life-history of the cases of so-called dementia præcox. We are justified in emphasizing the process of a crowding out of normal reactions, of a substitution of inferior reactions, some of which determine a cleavage along distinctly psychobiological lines incompatible with reintegration. Psychobiological analysis and reconstruction furnish us the essential material, and progress is to be expected from a frank and unprejudiced weighing and use of this material including its non-mental components rather than from the stereotyped lesion-pathology and the dogmatic nosological principles when they become intolerant.

I could not have had a more delightful opportunity to present a discussion of the essential facts in favor of a dynamic conception of dementia præcox than this occasion as I realize that my development has to no small extent been influenced by the spirit at Clark University, its genetic attitude and the liberality in admitting the facts for investigation whether they seemed to fit preconceived plans or not, and its strong faith in the selective capacity of interest and in an unprejudiced inquiry with or without laboratory methods, but always with an interest in the conditions under which reactions develop.

THE PAST DECADE IN EXPERIMENTAL PSYCHOLOGY¹

By E. B. TITCHENER

I am to speak in this hour of the course and progress of experimental psychology during the past ten years. The psychological laboratory has, as you know, had but a short history; and the modern psychologist counts in decades, as the historian of human thought counts in centuries. It is, I hope, not out of place to remind you that even the century is an artificial unit; when we think of the philosophy of the eighteenth century we certainly include Locke in our list of writers, although Locke died in 1704; when we think of the psychology of the nineteenth century we certainly do not include Fechner, although Fechner came after Herbart. The century, none the less, serves a useful purpose, because a hundred years, three human generations, are as a rule sufficient for the testing of an idea, for its establishment or its final rejection. Of our own unit, the decade, we can say no more than that, in the precocious development of the later-born sciences, it is at least a period long enough to warrant an inventory or stock-taking, from which we may gauge the trend of interest in the immediate past, formulate problems for the present, and possibly infer the direction of inquiry in the immediate future. The ten years whose psychological activity I am to review have, however, a special claim upon the historian. Beginning in the nineteenth, they lead us at once across the line of secular division into the twentieth century; they embrace the culmination of the one and the first effort of the other; and I cannot resist the belief that all the sciences, old and young alike, approached this twentieth century with a certain self-conscious expectancy which, however difficult to appreciate to-day, will presently be seen to have exercised a marked influence upon the intellectual movement of the time. It is, then, if I read the signs aright, a period of unusual interest and of especial scientific significance that has formed the second decade in the life-history of Clark University.

Nevertheless, as I approach the topic of this lecture, what is

¹ Lecture delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909.

uppermost in my mind is a sense of irreparable loss. When the cable brought the bare news, last February, that Ebbinghaus was dead, just a month after the celebration of his fifty-ninth birthday, the feeling that took precedence even of personal sorrow was the wonder what experimental psychology would do without him. You are all familiar with Ebbinghaus' work; to some of you, as to myself, his death has meant the loss of a friend: those who had not known him, but had looked forward to his promised address from this platform, have missed an experience that should have remained a lifelong memory. I shall not here attempt an eulogy: that is unnecessary. But I must remind you that Ebbinghaus' qualities were precisely those that, in its present stage of evolution, experimental psychology seems most to need. What characterized him was, first, an instinctive grasp of the scientific aspect of a problem,—scientific as distinct from philosophical, in all the protean meanings of that latter term; secondly, a perfect clarity of thought and of language, the expression of thought; and thirdly, an easy mastery of the facts. I say mastery; but the truth requires a stronger word. There was about Ebbinghaus a sort of masterfulness; he never did violence to the facts, but he marshalled them; he made them stand and deliver; he took from them, as of right, all that they contained; and with the tribute thus exacted he built up his theories and his system. This, I say, was the example that we needed, in a time when psychology still appears helplessly entangled with theory of knowledge; when the standard of scientific writing, so far as literary style is concerned, is deplorably low; when theory is impatient of fact, and the facts themselves are scattered and inco-ordinate. I believe, indeed, that Ebbinghaus' *Grundzüge*, already in its incomplete form a centre of widespread influence, was destined to a place of leadership; I have sometimes thought that, with allowance made for changed conditions, it might prove as important to experimental psychology even as Wundt's *Physiologische Psychologie* or Brentano's *Psychologie vom empirischen Standpunkte*. But Ebbinghaus is gone; and with his passing our science has sustained the most grievous loss that it has been called upon to bear since Delbœuf undertook that fatal journey to Munich thirteen years ago.

These brief remarks, inadequate as you must feel them to be, will at any rate in their spirit and intention command your assent. I pass now to another preliminary matter, upon which agreement is hardly to be expected. For agreement implies, in the first instance, a common point of view; and my own standpoint, which is that of pure science, or the desire for knowledge without regard to utility, is in all likelihood shared

only by a small minority of this audience. Moreover, agreement within the domain of pure science presupposes a certain measure of progress, a platform of assured results; and to that point, perhaps, experimental psychology has not yet attained. Nevertheless, while I anticipate that you will reject my conclusion, I trust that you will also remember the general attitude and point of view from which it is derived.

If, then, one were asked to sum up, in a sentence, the trend of psychology during the past ten years, one's reply would be: Psychology has leaned, very definitely, towards application. And if the questioner were thereupon to look for proof of this statement, he would find it confirmed not only by the range and variety of current practical work, but also and more particularly by the incursion into the field of practice of men whose training and previous interests might naturally have held them aloof. I shall not try to indicate the surprises that this movement towards application had in store for the theoretical psychologist; still less shall I try to set before you with any fullness the evidence for the strength and universality of the movement itself; I mention only a few typical facts. In 1903 Meumann opened the pages of his *Archiv. f. d. ges. Psychologie* to studies in applied psychology; and in 1905 Wundt alleges the preponderance of these studies as a principal reason for the foundation of the *Psychol. Studien*. In the same year 1903, Stern began the publication of his *Beiträge z. Psychol. d. Aussage*, which by 1907 had developed into the *Zeits. f. angewandte Psychol. und psychol. Sammelforschung*. Meinong writes in 1904 that experimental psychology, now brought into touch with the needs of practical life, is on the way to become a popular science; and expresses the hope that the contact of theory and practice may grow constantly closer. In 1906 Jung published the first volume of his *Diagnostische Assoziationsstudien*. In 1907 Meumann gave us two volumes of lectures on experimental pedagogics, with the promise of a system to follow. In 1908 Binet formally devotes his *Année psychologique* to the cause of practice; psychology is to be laid out and aligned with reference to practical and social questions. The present year has seen the publication, in English, of two popular works—Münsterberg's *Psychotherapy* and Watt's *Economy and Training of Memory*—which by diversity of aim and content as well as by form and style bear witness to the scope of application. I have mentioned such things as occurred to me: the more omissions you remark, the more securely will my thesis be established.

Now we have all heard it said—and said in connection with this practical tendency of recent work—that experimental psychology cannot hold its men; that its problems are not large enough to satisfy our intellectual demands; that the ex-

perimental psychologist will inevitably turn, sooner or later, to æsthetics or theory of knowledge, to physiology or general biology, to education or therapeutics. There is, in fact, some leaven of truth in that statement, and there is much untruth. Remember that no experimental science can hold its men beyond a certain term of life; remember that a large proportion of our students come late into the laboratory, and that they bring no habit of experimentation with them; and remember also the natural indolence of mankind, and how much easier it is to write an essay than to plan and carry through a series of experiments. But notice, on the other hand, that the experimental psychologist oftentimes has no choice allowed him; he may even hold his office under a foreign title; he is called to represent, in the economy of the university, a group of more or less closely related disciplines; and while no man to-day would claim for himself the title of physicist, it is not thought amiss that a philosopher or an educator should make a by-work of experimental psychology. All these things must be taken into account,—though I doubt if any one of them goes to the heart of the matter. The essential point is, surely, this: that many men, who are not by temperament psychologists, pass through the psychological laboratory on the way to their proper goal. Some are attracted by curiosity, by the mere charm of novelty; some desire in more serious mood to see and to understand. For all, psychology lies, convenient and accessible, at the cross-roads of human knowledge; and we who dwell there can only be grateful to those who for a season share our labors, while we hope, as soon as may be, to bid the casual visitor godspeed.

Under these conditions, the diversion into practical channels of energy which would otherwise have been expended in the service of the laboratory must be regarded as a definite loss to pure science; and it is from the standpoint of pure science that I am now speaking. You will reply, perhaps, that there are compensating advantages. For those who apply psychology testify, in the act, to the soundness and relative maturity of psychological ideas. And if we may judge by the experience of the older sciences, of physics and physiology, the trial of these ideas in practice will react upon the ideas themselves; application will discover new problems, which must be referred back for solution to the experimentalist. I recognize the advantages; but I do not think that they offset the loss. Every one, for instance, who has followed the history of science, knows that successful application is but a very imperfect measure of the validity of a theory; material improvement may go astonishingly far under the guidance of some scientific hypothesis which later generations

roundly pronounce erroneous, and which shows, indeed, but a glimmer of the later found truth. Pragmatism, as it was at first interpreted by its critics, and as it seems at first to have been intended by some, at least, of its propounders, could never pass muster with men of science, who see how well ideas may work upon how precarious a basis of fact. But, if we leave generalities aside, and consider the actual status of experimental psychology, we are still forced to the conclusion that this first argument overshoots the mark; it ranks as final achievement what is, for the most part, no more than tentative suggestion. And as for that other argument, of give and take, action and reaction between theory and practice, I confess that I am a little tired of it. Some day, if analogy may be trusted, it will hold; to-day it is but the expression of a pious hope. For application, if I read the documents fairly, has proceeded in two principal ways: it has borrowed and transformed some approved psychological method, or it has adopted and popularized some assured psychological result. I have nothing but respect for the men who by ingenuity and hard work make so much out of so little; but I cannot believe that either of those procedures will, by reaction, bring any considerable gain to science.

These, however, are merely counter-arguments, rebuttals; and it behooves a minority to be aggressive. Let me add, then, a positive statement. So far is experimental psychology from any general readiness to furnish ideas for application, that applied psychology has been obliged to think out ideas for itself; and so far is applied psychology from reliance upon the parent discipline, that some of its most widely used and most strongly emphasized ideas contravene established scientific principles. The notion of a quasi-mechanical dissociation, for example, or various modern forms of the doctrine of the subconscious,—these ideas are both foreign to the spirit and inadequate to the status of experimental psychology; they are stumbling-blocks in the path of scientific enquiry, obstacles that it will take time and labor to overcome. Not only, therefore, has the movement of the last few years, by its withdrawal of men and its substitution of practical for theoretical interests, brought with it a loss to science; but it has also, in the manner indicated, placed positive hindrances in the way of scientific advance.

That is the situation, as it appears from my point of view: others will see it differently. It is, in any case, a situation that must be accepted; and we have now to consider how, because or in spite of it, experimental psychology, the theoretical psychology of the laboratory, has fared during the past ten years.

I wish that I could proceed systematically. But, as we have already seen, psychology is not ripe for systematization. Let that be said emphatically:—and when you hear criticism of the claims advanced or the promises made by experimental psychology, remember, in all justice, that it has been said emphatically, and be at the pains to discover whether the claims and the promises come from psychology itself or from some less responsible enthusiasm. We must, in fact, proceed topically, though we shall naturally begin with the three fundamental topics of sensation, affection and attention.

In the sphere (1) of *sensation*, the most striking fact to record is the revival and extension of Fechnerian psychophysics. We have but to exceed our time-limit by one year, and we may start out with Martin and Müller's work upon the differential sensitivity (1899). Then follow Foucault's *Psychophysique* in 1901, Wundt's fifth edition in 1902, Lipps' *Grundriss* in 1903, Müller's *Gesichtspunkte und Tatsachen* in 1904, Aliotta's *La misura in psicologia sperimentale* and my own *Experimental Psychology* ii. in 1905, Lehmann's *Psychologische Methodik* in 1906, Wundt's sixth edition and Urban's *Statistical Methods* in 1908—to say nothing of a number of authors (Ament, Fröbes, Mosch, Holt, Laub and others) who have published single papers of considerable theoretical interest. Truly, there is hope for a generation which, in the midst of practical activities and despite the clamor for results, can find the time and the men to pursue in this persistent way the study of scientific method! And the outcome? The outcome is that, on the level of ordinary quantitative work, we now know enough to check our methods; we can prove our sums, as the children say; our figures have a definite scientific meaning and a general scientific setting. There will still be differences of opinion; there will still, no doubt, be controversies; force of habit would see to that, for some years to come, even if there were no questions of fact that remained unsettled. But it is a great deal, in science, to be sure of your ground, to have sifted out personal opinion and speculative guesswork from observed fact and genuine problem; and I think we may say, without undue optimism, that psychophysics has now reached that stage of self-knowledge, and has thus been lifted, with no fear of relapse, to a higher plane.

This, as I said, is the most obvious advance to record in the recent psychology of sensation. You could, indeed, hardly expect that progress should be as clearly marked on the side of quality, where the mass of established fact was already very large, and where—thanks to the co-operation of the physiologists—productive work has been continuous. If, however, I were called upon to mention a single noteworthy

event, I should select the re-issue of Hering's *Lehre vom Lichtsinn*, in which the veteran author has set himself, after the lapse of a generation, to theorize afresh the whole realm of visual sensation. Another gift from physiology is the third volume of Nagel's *Handbuch*, which will henceforth be to our students what Hermann's *Handbuch* has been to ourselves. And if we feel a natural regret that the old order should change and the authorities of our youth lapse into forgetfulness, let us at the same time recognize that the change does but emphasize the debt of psychology to its sister science: a debt, moreover, that must remain unpaid so long as physiology refuses the sole return that we can make, and physiologists decline instruction in psychology. For the rest, I may roughly indicate the progress of the decade by reminding you that we have to-day no satisfactory theory of sight or hearing, of taste or smell, of pressure or temperature; the generalizations that worked so well for science a few years ago, and that still do good service in the text-books, are in the minds of those who know breaking down under the stress of newly discovered facts; and the passing of established views is only one aspect of a process which, looked at from the positive side, leads to reconstruction. But again, if I must be concrete, I can choose a single instance: the revival during the last few years—in the hands of Meumann, Becher, Murray—of experimental interest in the organic sensations. When we remember the importance of organic sensation in the affective life, its importance as the vehicle of sensory judgments in psychophysical work, the part it plays in the mechanism of memory and recognition, in the motives to action, in the primary perception of self, in many of the complex formations that go by the general name of thought: when we remember the systematic questions that hinge upon it,—the question of the elementariness of pleasantness-unpleasantness, of the relative range of sensation and image, of what is called affective memory, and so on; we can hardly fail to see that these modest beginnings promise to fill up a great and painful gap in our psychological knowledge. It is too early to ask for results. It is something if we realize, in a fairly definite way, the difficulties of method that the experimenter must overcome before results are obtained; or rather,—it is everything that the experimental study of organic sensation has actually been attempted.

I undertook to speak of progress, not of problems. Yet I do not like to miss this opportunity of public reference to a problem which, although it has already been approached here and there, in a general way, seems to me just now to call pressingly for detailed treatment: I mean, the problem of sensible dura-

tion. In our analytical study of complex formations,—perceptions, perceptual groups, and especially total consciousnesses,—we must, I am convinced, make greater use of the temporal attributes of sensations. Is there any one who has not, time and again, been puzzled and surprised that experiences which felt so differently should come out so similarly in analytical terms? Well, experimental psychology, in its natural concern for intensity and quality, has unduly neglected the other aspects of sensation, and among them this aspect of duration. Wundt has set us a good example; he has employed duration, as an instrument of analysis, in his recent discussions of feeling and emotion; and I venture to suggest that the example is one to be followed in all departments of laboratory work.

This mention of Wundt takes us easily to our second introductory topic, the topic (2) of *affection*. Wundt, as you will remember, published in 1896 the first draught of his tridimensional theory, and in 1900 his *Bemerkungen zur Theorie der Gefühle*; Stumpf published in 1906 his paper *Ueber Gefühlsempfindungen*. These dates are significant: for they imply that the experimental psychology of feeling, which begins with Féré in 1887 and Lehmann in 1892, attains its full development in the decennium now under review. The threshold year 1899 is important here, by reason of Lehmann and Angell and Thompson, as we saw it to be important for psychophysics. Then follow, in quick succession, the experimental studies of Zoneff and Meumann, Brahn, Titchener, Gent, Bonsor, MacDougall, Orth, Boggs, Gordon, Störing, Kelchner, Hayes, Urban, Johnston, Keith, Shepard, Alechsieff, Salow, Kaestner, Nakashima,—studies that differ in method and in result as they differ also in scientific value, but that are all alike aimed directly upon an experimental control of the affective reaction. How near we have come to a stable psychology of feeling, I confess that I do not know; the smoke of controversy lingers, and it is impossible to get a clear view of the field of battle. Perhaps, for a little while, we shall none of us know; perhaps, we must await some new strategic movement to reveal the strength or the weakness of the various positions. I read, only the other day, that the attempt to build up feelings out of sensations has now been completely abandoned,—and I remembered, with some amusement, how many psychologists are still at work upon that task. No! in all such statements the wish is father to the thought, and the thought is but the wish become dogmatic. A more cautious estimate might, I think, venture upon three propositions, but could hardly go beyond them: first, that we have transcended, for good and all, that pseudo-Darwinism which, running directly counter to the intention and the accomplishment of Darwin's great work,

offers a facile teleology in place of scientific explanation, and deems the affective problem solved when it has written 'useful' for 'pleasant' and 'harmful' for 'unpleasant;' secondly, that our working hypotheses are adequate, intensively and extensively, in range and in detail, to serve as guides to experiment; and, thirdly, that the investigations so far published, inconclusive as you may judge them to be, nevertheless prove that experiment is possible. And this, you must remember, is the sole source of anxiety in an experimental discipline,—whether, when a question has been asked, the method of experiment can furnish a valid answer. So there is always, at the outset, a certain rush and hurry of research, and a certain immaturity in publication; but, the main point settled, and experiment shown to be feasible, the problem is put upon the regular waiting list, to be taken up at leisure. That is, as I see things, the present status of affective psychology. In the meantime, Wundt has made his tridimensional theory the basis of a psychology of language; and Stumpf has made his theory of a centrally excited accessory sensation the basis of a genetic psychology of the tonal and musical feelings: and while the two theories are incompatible, both of them appear to work.

I pass (3) to the psychology of *attention*, which I take to be in yet another characteristic stage of development, less advanced than the psychology of sensation, but more advanced than that of affection. Historically, such a state of affairs is but natural: for experimental work upon attention was begun by Wundt in the sixties, while the experimental study of affection dates only from the late eighties of the last century. And the bare fact that it thus occurs to one to measure progress by lapse of time is significant and encouraging, since time means nothing for science until methods have been thought out and men are trained to apply them. Nevertheless, I must not give you the idea that our knowledge of attention has increased continuously, little bit by bit, as the years have passed; that there is any historical analogy of that kind between sensation and attention. On the contrary, the doctrine of attention has shown very markedly the characteristics that certain psychologists ascribe to attention itself: it has fluctuated, risen and fallen again; wave of interest has alternated with period of indifference. Ebbinghaus wrote, in 1902, that attention is a real perplexity in psychology: "die Aufmerksamkeit ist eine rechte Verlegenheit der Psychologie;" and I think that he himself felt what he wrote; his treatment of attention is a little perfunctory, as if the composing of those sections had been a disagreeable duty. The same sentence stands in 1905; and, indeed, the whole discussion has remained practically unchanged

from the first to the second edition of the *Grundzüge*. Yet I believe that, at this latter date, one of our attention waves was gathering to a head. At any rate, the next three years saw the publication of as many systematic treatises: Pillsbury's book appeared, in French and English, in 1906 and 1908, and in 1907 came Dürr's *Die Lehre von der Aufmerksamkeit* and Roerich's *L'attention spontanée et volontaire*. It is true that the French and German authors are largely concerned with practical issues; but they deal with attention from the side of theory also; and Pillsbury's work, the most comprehensive of the three, devotes only a few pages to educational matters. Now, these men must have found something to say: and while their teaching is, in good part, inferential, even speculative, it rests, none the less, upon a broad basis of actual observation. There are two things, in particular, that to my mind attest the progress of the past decade. The phenomena that we have been wont to refer to as the fluctuations of attention are now shown, pretty definitely, to be peripherally conditioned; I, at least, am unable to put any other interpretation upon the facts; and the psychology of attention thus loses a chapter which has always been a fruitful source of confused thinking. For there are two main uses, in current investigation, of the term attention. In the practical studies of economy of learning, and the like, attention has an energetic meaning; we hear of energy of attention, distribution of attention, quickening of attention, recovery of attention, and so forth. All these phrases are readily intelligible, since they simply give precision to the usage of everyday life; and they are also sufficient for the writers' purpose, since they designate, unequivocally, certain well-marked events or phases of the process of learning. At the same time, it must be remembered that they are employed, casually and by the way, in the course of inquiries which are not themselves directed upon an analysis of attention. The point is important, if it is a little obvious, and I pause a moment to illustrate it. In work upon the affective processes, we often refer a judgment roundly to 'association;' in work upon association itself, we often record an 'attitude' of perplexity or doubt or hesitation as a link in the chain of interconnected processes: the abstract terms 'association' and 'attitude' meet the conditions of the inquiry, and no one can quarrel with their use. But no one, either, can doubt that they presuppose a psychology; they imply a foregone psychological analysis: and what holds of them holds similarly of the term 'attention.' Now, when we turn to the second, analytical meaning of attention, we find that our concern is with the clearness or vividness of conscious contents; energetics drops out of sight. But you will see that the notion of a fluctuation of attention, of apperceptive waves, suggests the ebb and flow of

energy, so that we are constantly tempted, even when engaged upon a purely analytical task, to take attention for granted, to employ it as *datum* in the very context which we have arranged for it as problem. It is in this way that confusion has arisen, and it is on this account that we may rejoice to refer to sensation phenomena that, ever since the days of N. Lange, have been attributed to the attention.

I said that there were two things that bore witness to the progress of the decade; and the second, which I can but briefly mention, is the revival, with good promise of success, of the attempt to measure the attention, to give quantitative expression to distinguishable degrees of clearness. It is still too early to discuss this work in any summary way. The impulse to it comes, most appropriately, from the Leipsic laboratory, and Wirth's further researches will not only be awaited with eager interest, but will also, as we may hope, arouse activity in other quarters.

So much, then, for sensation, affection and attention. Our topical survey will bring us next, I imagine, to that mixed medley of formations which is included under the general term (4) *perception*. It is altogether impossible to review, in the time allotted to me, the work accomplished in this field of vast range and uncertain limits: I have tried, as I was in honor bound to try, and I have given up. You must be content with a purely subjective and arbitrary selection. I found, as a matter of fact, after refreshing my memory of some hundred experimental papers, that I had been most impressed by the work of Benussi on optical illusions, on the perception of time, on the comparison of spatial distances and temporal intervals; it seems to me that Benussi's treatment of the apprehension of form, his notion of the inadequacy of idea, his doctrine of accidental figure, and so on,—that all this is of positive value in itself, and will bring forth fruit in the future; and my judgment has remained the same, as study followed study, although I am by no means able to accept Benussi's interpretations. The Austrian school—however widely we may differ from them on systematic questions—have, indeed, made notable contributions to this chapter of psychology. For the rest, these ten years appear to have hardened and emphasized the special characteristics of American work upon the perceptual problem. Perception, in the cis-Atlantic laboratories, has been given a biological setting and perspective, and the theories of perception have been motor theories. I do not think that any good has come from the intermixture of biology; on the contrary, there has been a tendency to substitute final for efficient causes, and general considerations for exact psychophysical determination.

I am also heretical enough to think that our current motor theories are both premature and one-sided: premature because they far outrun our knowledge of the motor mechanism, and one-sided because they directly attach the motor to the receptive organs, and forget the disjunctive office of the cortex. But I do not, on this account, underestimate the achievement of Dodge and Münsterberg and Judd.

I pass from perception to the cognate subjects of (5) *recognition, memory and association*. Ebbinghaus, as I need not remind you, published his experimental study of memory in 1885; and there was no lack of experimental papers in the nineties. But consider our initial year, 1900. That year saw the issue of Müller and Pilzecker's *Exp. Beitr. z. Lehre vom Gedächtniss*; of Laura Steffens' work *Ueber die motorische Einstellung*, and Lottie Steffens' *Exp. Beitr. zur Lehre vom oekonomischen Lernen*; of Kemsies' and Netschajeff's articles on the memory of children; of Smith's *Rhythmus und Arbeit*. Our decennium began well; and it ends as it began; for it was only the other day that we received the second and concluding portion of Wreschner's elaborate memoir *Die Reproduktion und Assoziation von Vorstellungen*. In truth, this investigation of memory and association illustrates and accords with the tendency of the time. Ebbinghaus himself conceived his problem rather in a practical or psychophysical than in a psychological spirit; and, in the light of what I have already said, you will find it natural that his example should be followed,—all the more natural, indeed, since in this particular field psychophysics and practice are closely and obviously related. There are, however, in reality, three distinct problems. We may aim at a psychology of memory and recognition and association; that is, we may seek to record our experience, to trace introspectively the arrangement and course of consciousness as we remember or recognize or associate. We may aim, secondly, at a psychophysics; we may trace and measure the action of the reproductive and perseverative tendencies, evaluate the parts played by the reproductive and the recognitive factors, work out formulas of the same kind as that first formula of Ebbinghaus which represents retention as a function of time elapsed. Or we may aim, thirdly, at an applied psychology; we may lay down rules for the training and the economical use of memory. There can, now, be no doubt that the two latter aims have, in the period which I am reviewing, taken precedence of the first. But psychology has by no means been neglected: Cordes' analytical study of association appeared in 1901; Whipple's analysis of the memory image and the process of judgment in discrimination, in 1901-2; Gamble and Calkins' experiments

upon recognition and comparison in 1903; while Kuhlmann, who worked for the most part in the Clark University laboratory, has published in 1906, 1907 and 1909 a series of articles devoted especially to the introspective characterization of the memory consciousness. If to the results of these enquiries we add the indirect results of the psychophysical experiments—and indirect or secondary results have always been of great importance in experimental psychology—we have a considerable body of knowledge, even though it is not as yet either organized or complete.

I come next (6) to *action*. The reaction experiment we have had always with us, ever since the psychological laboratory came into being; it is an experiment that has been sorely abused, in word and in deed; yet so many are its possibilities, that interest in it has never flagged; and we are now beginning to see that it furnishes an invaluable instrument of psychological analysis. The decade opens with a number of technical papers: W. G. Smith in 1900 and 1903, and Judd and his collaborators in the Yale laboratory in 1905, have sought to determine the nature of the reaction movement; and Alechsieff in 1900, and Bergemann in 1905, have essayed new methods of quantitative evaluation. But this, the technical or psychophysical aspect of the experiment, has been overshadowed by the psychological. In 1905, Ach published a book entitled *Ueber die Willenstätigkeit und das Denken*,—a book which reports and discusses the employment of what the author terms, a little redundantly, the 'method of systematic experimental introspection' in a series of experiments upon simple and compound reactions. He could, indeed, hardly have chosen a more promising field. For although Kuelpe said as long ago as 1893 that "reactions are nothing else than exact types of . . . voluntary action, . . . so that their mere duration is but a small part of their psychological significance," and although Wundt has repeatedly endorsed this statement, no one before Ach had made any serious attempt to build up a psychology of volition and action upon the introspective data which the reaction experiment affords. In brief outline, Ach distinguishes a fore, mid and after period of reaction: the fore period extends from signal to stimulus, the mid or principal period from stimulus to reactive movement; the after period is a time of indefinite duration, but certainly lasting several minutes, which follows immediately upon the conclusion of the experiment. The method of systematic experimental introspection then requires that the events of the fore and mid periods be introspectively examined, as a whole, during the persistence of the perseverative tendencies in the after period. I shall have to refer, in

my second lecture,¹ to the results of Ach's investigations; it is enough now to say that those results have thrown a flood of light upon the action consciousness, and that they are happily confirmed by the outcome of other experiments, especially by the work of Watt, undertaken independently and for a different purpose. Hitherto, the chapter in our text-books devoted to the psychology of action has been a medley of evolutionary biology, physiology, and vague psychological generalization; henceforth, it will contain facts of psychological observation.

I wish that I could say as much (7) for *imagination*. But indeed, whether we begin with the elementary process, the image, or whether we go to the other extreme, and regard imagination as the general name for a group of typical formations, as a concept co-ordinate with memory, we must surely say that experimental psychology is to-day hardly over the threshold of the subject. My own belief is that we must start out with the image, and determine, for instance, whether image quality is co-extensive with sensation quality, and whether imaginal difference is adequate to sensible discrimination. More especially must we make a serious effort to resolve the paradox of the image: that it is so readily confusable with sensation, and yet so easily and certainly distinguished. Much may be hoped, I think, from the current studies of imagery, and from the incidental results of work upon thought and voluntary action. Thus we have recently found, in my own laboratory, that on one important point the popular psychology of memory and imagination inverts the facts: the image is available for memory, not because or in so far as it is stable and permanent, but precisely because it is instable and breaks down; because it admits of fusion, telescoping, substitution, and thus enables us to carry a great deal of experience in condensed and abbreviated form; while the imaginative mind, at any rate on the average level, is not a mind whose images change kaleidoscopically, producing by their instability new and still newer mental combinations, but is, on the contrary, a mind equipped with an almost photographically persistent imagery, which may be contemplated and arranged at leisure. This is natural enough, when you have discovered it; but it is hardly what you would have argued *a priori*. I might cite a number of similar results: but the facts stand in isolation; in the main, imagination is virgin territory, and awaits as it invites the pioneer.

Of the more complex (8) *affective formations* we can say but little until we have an assured psychology of feeling. I

¹ "The Psychology of Thought." This Lecture is not here reprinted, as the author has recently published a more extended discussion of the subject.

remarked, earlier in this lecture, that Wundt has made significant use, in his theory of emotion, of the temporal aspect of mental processes; and I think that the future experimenter will do well to take the hint. But we cannot analyze emotion and sentiment, with any prospect of final success, until we are agreed upon the nature and number of the affective qualities.

It is a relief to turn from these topics, of imagination and emotion, to the problem (9) of *thought*. We have found various things that may with some truth be called 'characteristic' of the experimental psychology of the last ten years: the revival and extension of psychophysics, the focalizing of the affective problem, the emergence of a tangible psychology of attention, the establishment of the laws of memory. Nevertheless, if I were asked to name a single line of investigation that, more than any other, has characterized the decennium, I should not hesitate to select the experimental studies of the thought-processes, most of which we owe to the Würzburg laboratory. Not that these researches have been confined to Germany: on the contrary, Binet in France, Woodworth in the United States, Bovet in Switzerland, as well as Marbe and his successors at Würzburg, have all attacked the same problem; though it is true that the German work has been the most thorough and the most persistent. Here is a new departure in experimental psychology; concept and judgment and inference, the last refuge of the rational psychologist, have been ranged alongside of sensation and association, introspectively analyzed and made subject to the chronoscope. I shall endeavor, in my next Lecture, to give you some idea of methods and results, and to point out the most promising paths of future enquiry.

So I finish the principal part of my review. If I have omitted anything of consequence, or if I have seemed to do injustice to any department of work, I must ask for pardon and correction; I have spoken with the utmost possible brevity. It remains, now, to say something of the extensions of the experimental method beyond the limits within which the present discussion has moved. What of individual psychology; of the psychology of the minor abnormalities—sleep, dreaming, hypnosis; of experimental æsthetics? What, last but not least, of comparative psychology?

I have time only for a word or two. Individual psychology, which was first systematized by Stern in 1900, is, in its modern form, one of the chief witnesses to the value of experiment. It furnishes the key to many, otherwise inexplicable differences of result, and it promises to allay many of the standing controversies of the text-books; there can be no

doubt that it will play a part of steadily increasing importance in the immediate future. The psychology of the abnormal seems, on the contrary, if I may venture an opinion, to have failed somewhat of its theoretical promise; recent interest has turned toward application. Vogt's method of 'direct psychological experiment in the state of hypnosis' has not helped us, as some had hoped it would, to an affective analysis; and although Martin and Ach have brought hypnosis into the laboratory, it does not appear probable that their example will be generally followed. Experimental æsthetics has shared in the recent horizontal expansion of psychology at large. A review of the work done upon colors and spatial forms, which appeared in the sixth volume of the *Année psychologique* (1900), mentions no more than five investigators; and there is an interval of more than twenty years between the first and the second, between Fechner and Witmer. But when Kuelpe came to prepare a similar review for the 1906 Congress of Experimental Psychology, he found a wide extension of subject-matter, a whole armory of methods, and a very considerable body of results. No doubt, the time is still distant, if indeed it is fated to arrive at all, when experimental æsthetics shall bear to a *System der Aesthetik* the relation that experimental now sustains to systematic psychology. In the meanwhile, it is satisfactory to know that, in this as in other directions, the American laboratories are doing their full share.

Again, however, there is something still more characteristic to follow: I mean, of course, the rapid growth of an experimental psychology of the lower organisms, a growth that is evidenced by the issue of books, the manifold publication of technical studies, and the invasion of our laboratories by various unwonted forms of animal life. The present status of comparative psychology has already been set forth by an authority far more competent than myself; and I desire now simply to give expression to my personal feelings, as the director of a laboratory primarily intended for the investigation of human consciousness. Personally, then, I welcome the animals, both for my own sake and for theirs. For my own, because I think that the comparative work exerts a wholesome influence upon the humanist. It is difficult to lay one's finger upon any definite point of indebtedness; but I am sure that many of my ideas have been quickened and clarified by acquaintance with the problems and methods of comparative research. And for the sake of the animals: because a comparative psychology can be built up only by men who have had their training in human psychology. Of that fact there can be no manner of doubt. The zoölogist may, and probably does, excel the psychologist in his mastery of biologi-

cal technique. But psychology also has its technique: psychology has its attitude, its point of view, its permissible and its impermissible questions, its methodological equipment, a technique that it takes time to acquire; and if you lack it, you may observe animal behavior with all the patience and all the accuracy conceivable, but you will not attain to a comparative psychology. Until such time, therefore, as experimental psychology forms a recognized part of every man's general biological training, training in physiology and zoölogy and the sciences of life at large,—until such time, the place for the animals who are to reveal the range and character of their mental endowment is the psychological laboratory.

I am almost at an end; and I have given you, I am afraid, little more than a string of names and a few general remarks; though, after all, one cannot do much in an hour. There is, now, one further point that I desire to discuss before I close. I have taken it for granted, throughout this lecture, that the primary aim of psychology is the analysis of mind. Yet a great deal has been written, of late years, against psychological analysis. Consciousness, we are told in effect, is a living continuum; but the analyst kills in order to make his dissection; and, after killing, he is unable to restore the life that he has taken, to show consciousness in its original integrity. This argument, if it were taken seriously, would apply to biology as well as to psychology, and would banish the muscle-nerve preparation and the microtome from the biological laboratory. But, indeed, it rests only upon misunderstanding,—a misunderstanding due in part to temperamental reaction, in part to the pressure of history and tradition. When the physiologist describes a tissue as 'composed' of muscle fibres or nerve cells, nobody takes him to mean that the fibres and cells existed first, in isolation, and that they were presently brought together, by some law of organic growth, to constitute the tissue. What grew was the tissue itself, which the physiologist now finds, in his *post mortem* examination, to consist of the cells or the fibres. Nevertheless, the analytical psychologist is supposed to generate his mind by allowing sensations to fuse and ideas to colligate, precisely as the physiologist might be supposed to generate a muscle by allowing the fibres to 'constitute.' In reality, to charge the analytical psychologist with deriving mind from the interconnection of the mental elements—and how often and how recklessly has not that charge been made!—is sheerly to misunderstand the purpose of analysis in the hands of those who use it.

The scientific legitimacy of the analytical attitude is, then, beyond dispute. Whether the results of analysis, in the sphere

of mind, are of 'value' is another question, and a question whose answer depends upon what one is disposed to consider valuable. What is psychology 'for?' If the object of the psychologist is to know mind, to understand mind, then it seems to me—in view of the overwhelming complexity of mind in the concrete—that his only course is to pull mind to pieces, and to scrutinize the fragments as minutely as possible and from all possible points of view. His results, in synthetic reconstruction, give him the same sort of intelligent grip upon mind that the analytical results of the physiologist give him upon the living body. To approach the study of mind without analysis would, in fact, be nothing less than ridiculous; and, in fact, no one does it. The most ardent advocate of mental integrity can follow up only one mental aspect or one mental function at a time.

I conclude that analysis is not only valuable, but indispensable to psychology; and I contend that many of the current arguments urged against psychological 'atomism' betray a woeful misunderstanding of scientific methods, and that much of the current depreciation of analytical results betrays a like misunderstanding of the aim of scientific psychology. But, in saying these things, I am only repeating what has been more aptly said by Ebbinghaus. And as I began this lecture by deploring the loss which Ebbinghaus' untimely death has entailed upon our science, so I cannot end it better than by reference to the admirable sanity which marks his treatment of the wider issues of psychology in the first volume of the *Grundzüge*.

PART II

LECTURES AND ADDRESSES
BEFORE THE DEPARTMENT
OF PEDAGOGY

IN CONNECTION WITH THE CELEBRATION
OF THE

TWENTIETH ANNIVERSARY OF THE
OPENING OF CLARK UNIVERSITY

SEPTEMBER, 1909

BY

LEO BURGERSTEIN, THOMAS A. STOREY, GUY M. WHIPPLE
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THE DEPARTMENT OF EDUCATION

In connection with the Twentieth Anniversary of Clark University, lectures were given in the Educational Department treating especially school hygiene and mental hygiene, and conferences were held, where school hygiene, research in education, and the training of teachers were the special subjects for discussion. Lectures on School Hygiene were given by Dr. Leo Burgerstein of the University of Vienna and are published in the following pages. Lectures on the Psychology of Association and Mental Hygiene were given by Dr. C. G. Jung, of the University of Zürich. In this course Dr. Jung presented and illustrated his *diagnostische Assoziationsmethode*. Interesting as these lectures were for the direct results presented, they were still more significant, perhaps, because they suggested the possibility of establishing a truly mental hygiene based upon scientific principles. These lectures are published in connection with the report of the Department of Psychology.

The conferences on School Hygiene were led by Dr. F. B. Dresslar, University of Alabama, and Dr. Thomas A. Storey, of the College of the City of New York. While many speakers took part and there was much diversity of opinion, nevertheless, emphasis was placed upon the need of greater attention to school hygiene in courses for teachers and the importance of research both in education and hygiene.

The conferences on education were under the chairmanship of Dr. Elmer Ellsworth Brown, U. S. Commissioner of Education. Here again, perhaps, the significant feature was the emphasis placed on the need for research in education. Professor Hanus of Harvard University emphasized this in the field of school administration, showing that we have no definite norms in regard to what is necessary in the simplest matters, like what is the essential minimum of knowledge to be required in arithmetic, for example.

Among those who spoke at the Conferences were Dr. Leonard P. Ayres, Dr. E. F. Buchner, Dr. Leo Burgerstein, Dr. B. T. Baldwin, Dr. Thomas H. Balliet, Dr. G. Stanley Hall, Prof. Clark W. Hetherington, Dr. Adolf Meyer, Prof. A. O. Norton, Dr. Helen C. Putnam, Dr. C. E. Seashore, Dr. Guy Montrose Whipple, and others. The papers presented, with one exception, are published in the following pages.

In opening the first conference on the Opportunity and Need for Research in School Hygiene, the Chairman, Dr. Dresslar, spoke in substance as follows :

"As Chairman of this section, I wish to express my personal appreciation of the great honor shown me on this occasion, but more especially to express to President Hall, the Faculty, and Trustees of Clark University our sense of gratitude for the great work this institution has done in the twenty years of its existence. We are here to join in celebrating the twentieth anniversary of Clark University, an institution which, through the wisdom and unselfishness of its founder, Mr. Jonas G. Clark, was dedicated to research work. All those of us who have enjoyed its privileges as students are, I know, anxious to testify to the help and inspiration here received. It is indeed a distinguished service that has been rendered here, unselfishly and without ostentation, and we wish heartily to congratulate President Hall and all the officers of the University on the work accomplished, and to express our confident hope that the future of the University will bring still greater opportunities.

"Here in this quiet place, a small body of earnest and brilliant workers have wielded an influence which the world of scholarship has recognized and must forever hold in esteem. I, therefore, take great pleasure in expressing to the University at this time the felicitations of the members of this Conference on School Hygiene, composed as it is of the most prominent workers in this field in Europe and America. The movement for better health conditions in our schools owes much to this institution and especially to President Hall, Professor Burnham, and to all those who have wrought under their guidance.

"It is now our duty and privilege to begin this week's work with a conference bearing on the problems of Research in the field of School Hygiene. This is indeed a distinguished company, and there can be no doubt of the outcome of this conference. I trust that our eminent guests will feel quite at home in this atmosphere, and that all will participate freely in the discussions."

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DEPARTMENT OF PEDAGOGY

LECTURES AND ADDRESSES DELIVERED AT
THE CELEBRATION
OF THE
TWENTIETH ANNIVERSARY
OF THE FOUNDING OF
CLARK UNIVERSITY
BY PROFESSOR LEO BURGERSTEIN AND OTHERS

CO-EDUCATION AND HYGIENE WITH SPECIAL
REFERENCE TO EUROPEAN EXPERIENCE
AND VIEWS

By PROF. LEO BURGERSTEIN, Vienna, Austria

Wherever sexes in nature are diclinous, the individuals of one sex compete with those of the other. This is a sound state of things from the point of view of selection. But with the human race it seems as if in the centres of civilization the sexes as such engage in a struggle for life. Whether that promises a healthy state of things is to be doubted.

The question of an equal higher education for both sexes is a modern one. It has different sides, *e. g.*, an ethical one and a social-political one, and I suppose that one does not go far wrong in thinking that the practical social aspect, at least in Europe, has influenced the movement very greatly.

It is not my business to deal with the various sides of the question; I intend to speak of the hygienic point of view and its practical consequences for schools.

Everybody who wishes to get to the bottom of the question must fix his attention upon the secondary sexual characteristics and qualities. I do not wish to go into the matter in all the details so often spoken of, such as the difference of absolute and relative weight of the brain, the density of the cortex of the cerebrum, the difference of specific gravity of the blood, and so on. I may pass over the consideration of these subjects with less hesitation in this country since English possesses the exhaustive book on Man and Woman by Havelock Ellis. But in any case I think I must first of all consider some psychical points.

Whatever any one may think concerning the dependence of the psychical upon the physical, experience and exact investi-

gation point in the same direction, namely, indicating that female nature is not artificially inoculated by education; it is a matter of fact well known to every one that, *e. g.*, the development of the faculty of speech is quicker in female than in male children, the selection of games offers another example, and so on.

We who are present here are naturally specially interested in the differences during school years, and first, as they touch hygiene. It is true, however, that up till now far too little work has been done in the way of exact investigation, and we still need very many stones and often better cut with which to build our building. On the other hand, the inquiries in regard to certain psychological abilities in boys and girls, like the investigations of Bolton, Netchajeff, Lobsien, and others, though valuable do not exactly belong to the subject of hygiene in co-education. The existing experimental investigations upon our question are of different values in consequence of the different methods used, the number of individuals tested, and so on, and the results of the investigations are sometimes far from having only one significance. The question is the more difficult, since the results are far more trustworthy where the girls and boys have been developed under analogous psychical conditions. It is just the co-education schools themselves that would be our greatest help. That is the reason why I shall take special notice of such results.

It will generally be admitted that the psychical variability of the male type is greater than that of the female. The experience of persons who have occupied themselves during many years with the education of both sexes points in the direction that the differences of female scholarship are not so great as in the male; we have in German the words "Wunderkind" and "Wunderknabe," that is to say prodigy child and prodigy boy, but no such word for prodigy girl. Indeed there have been a number of such male youthful prodigies in mathematics or musical composition; and a further proof of the greater variability of the male children is, that the unfavorable abnormalities are more frequent with the male than with the female. Warner has made an investigation on about 50,000 children, nearly the same number of each sex, and found in round numbers 21% (20.8) of the boys but only 16% (15.6) of the girls defective. The analogous result as to bodily condition is shown in the valuable work of Gulick and Ayres on medical inspection of schools; if one omits the evils which are to be considered as having been acquired in consequence of the minor resistance of girls, the percentage of the 4,305 boys having defects is higher than that of the 3,301 girls. Gulick himself makes a very just remark in regard to this. In Bel-

gium the punishment of boys and girls in the orphan asylums was recorded and it was found that 31% of the boys, but only 26% of the girls had required punishment.

The classical country for co-education in high schools in Europe is the grand duchy of Finland in Russia, a country of very great culture, in which co-education in high schools has existed since 1883 and where, in 1908, there were 33 such high schools with a total of 3,569 girls and 2,863 boys. In the school year 1890-91 the first contingent of co-educated high school pupils were sent to the university. Lucina Haggman, an experienced female teacher in the *Laeroverk för gossar och flickor*, one of the oldest co-educational high schools at Helsingfors, has published articles on the question and is anything but averse to co-education; she says quite openly that boys show more aptitude and inclination for one special subject or another, whilst girls generally try to study all subjects in an equally careful and diligent way.

It may be that the smaller psychical variability of girls in comparison to that of boys is also connected with the greater suggestibility of the girls. In the old Helsingfors co-education school they say that it seems as if the boys had an innate tendency not to accept anything as true and to think that they have the right to doubt everything. From certain experiments of Gilbert, in New Haven, with hundreds of young people of from 6 to 17 years of age one can also judge that girls are more easily influenced by suggestion than boys.

As significant may be quoted also the breaking out of certain psychical epidemics, especially in girls' schools and, in exceptional cases only, spreading also to boys' schools. Trembling epidemics (*tremor hystericus*) have occurred in girls' schools in Basle in Switzerland in 1901 and 1904, where the girls fell, one after another, into a condition characterized by trembling of the extremities, which lasted for minutes or even hours. The same epidemics broke out in Meissen in Germany in 1905, 1907, and 1908, in Leipsic in 1907, in Frankenhausen in the same year, and in 1890 and 1892 even in two schools in villages. In a girls' school in Biberach in Germany in 1891 one girl fell into a state of hysteric somnolence, 13 others followed, so that they could not be awakened even by pricks of a needle, but one after the other walked about the room as if in a state of trance. Once in Munich the girls in one classroom bit the ends of their plaits of hair because they believed their voices would thereby become clearer, and the girls of a Hamburg high school ate scraped chalk to obtain a fine complexion.

It is certainly remarkable that such singular youthful neuroses found in girls' schools have only there a great suggestive influence. It may be a consequence of the greater suggesti-

bility that the power of application comes more easily to girls than boys. I quote some examples. Laser, in Königsberg, made investigations upon 112 girls and 114 boys of about 11 years, using certain simple counting operations once proposed by the author because they permit good control of quality and quantity of work. He gained better results with the girls than boys. What Miss Holmes found in the psychical laboratory of Leland Stanford University led to a similar conclusion. In each of the 10 months of the school year, for three years, Schuyten made the following experiments in a series of Antwerp schools: Boys and girls of from 7 to 14 years were required to perform some task lasting in each case 5 minutes, which enabled him to discover the percentage of pupils whose attention was spontaneous. The result was that the curve of attention with the girls showed, in every one of the 10 school months, a higher level than that of the boys. Long before this, a result in the same direction was obtained by Riccardi, in Bologna, who stated the relation between the industrious girls to boys as in the ratio 3:2. When walking through the corridors of the Vienna University one may get the impression from the number of lady students one sees there that there must be a high percentage of female students, but statistics show that there are only 5½%. The fact is that ladies are more regular in coming to the lectures, whilst an appreciable number of male students prefer what they call in German "schwaenzen" (cutting lessons). With regard to the difference of psychological ability to perform work at the same age, I have mentioned that I do not know of much material from exact investigation. Certainly it is to be supposed that there will be a notable difference. As to physical statistics, those of the late Key, in Stockholm, show clearly that girls of 11 years are in weight and height below boys of the same age, but they surpass boys at the age of 16. We get similar results from the investigations of Smedley as to vital capacity and of Porter as to chest girth. Ebbinghaus has found experimentally that in certain directions of psychical work boys of 11 years are above girls of the same age, whilst the girls of 16 years surpass the boys of that age. It is clear that such facts have an important bearing on the question of co-education.

As to work done in the single subjects of instruction in high school courses, we know almost nothing definite; at least I do not know of any exact investigation upon that question. It is true, also, that difficulties sometimes arise if one wishes to make investigations in school; more than one example could be cited of persons willing to make experiments who were not allowed to do so because headmasters or school-officers feared that too much of the time for instruction would be lost in that way.

Regarding the total result of school work I know of no positive information, except that coming from the co-educational high schools of Finland. There the successes in school have been put together in various ways. The following data from the city of Helsingfors are in point. It takes 9 years for a pupil to go through the whole course of the high school, and the final examination must follow on leaving. The average marks of three series of pupils who had been through the whole 9 years' course of a co-educational school were taken out of the school certificates. The higher figure signifies a better result. The average mark was, for the boys, 7.10; for girls, 7.89.

In order to see whether the results in the co-educational schools were similar to those found in schools where boys and girls are educated separately, comparisons with averages of other Helsingfors high schools were made, and the following results were obtained:

4 unmixed boys' schools,	7.29
The boys' series of a co-educational school,	7.30
The girls there,	7.68

This investigation shows always the better result with girls. That would signify in every case praise for the girls, even if greater application only had been the cause.

When we look at all this, there is no reason to be adduced against co-education in the high school; the only question is the difference we have referred to in the ability of the two sexes at the same age. We shall speak about that difficulty when we consider the practical solution of the problem. The lower standard of psychical variability in girls is no hindrance on the European continent, because for a great many years in European high schools no attention has been paid to the existence of special aptitude for a special subject, and in our classical or modern high schools every subject had to be learned equally by every one, and even now pupils are not allowed to omit one subject from the curriculum. A change of ideas is going on now in Germany in so far that, *e. g.*, in Prussia pupils who do not know enough at the final examination in one subject, but are very strong in another subject, are passed so that they may go on to the university and get degrees.

We see that according to European views there is no serious objection to be found against co-education in high schools. Now let us look at the physical side.

The completion of growth in boys requires a longer time than in girls. The difference between the physical condition of boys and girls shows itself very distinctly in their ailments, probably also in their mortality; as to the latter I quote only the statements of Hartwell of Boston: while the lowest mortality among boys is during the 13th, 14th, and 15th years,

among girls it is during the 12th and 13th years. With regard to morbidity we have data based upon very numerous observations coming from Denmark, Sweden and Norway. Investigations have been made, especially in Sweden, as to health, time of work, sleep, and so on. At that time no co-educational high school existed, but boys' public high schools and girls' private high schools. From the latter, certificates naturally had not the same value as those from the boys' schools, because in those days the girls who studied did not do so to get certificates to enable them to obtain positions like the boys. Mark well that in Europe certificates are a thing of the greatest importance in earning one's living, since without them public positions are impossible and others not at all easy to obtain. Now, the percentage of illness is as follows:

	Boys		Girls	
	investigated	% sickly	investigated	% sickly
Denmark, .	16,789	29.	11,336	41.
Sweden, .	11,210	34.4	3,072	61.7
Norway, .	830	21.9	500	36.7

The material is not quite the same. In the Denmark statistics are included boys of boarding schools and public high schools and girls of private high schools, in Sweden and Norway public high schools for boys and private high schools for girls. Further, the investigations in the different countries have not been made at the same season of the year; but in all these statistics no case of acute illness is taken into account, but only impairment of health of different kinds and various chronic troubles.

A small comparative investigation has also been made in Halle, Germany, of boys and girls from 7 to 14 years old only; there also the percentage of sickly girls is higher than that of boys, and reaches 50 %.

Sustained severe work for children under the conditions of school life leads very easily to repeated nose bleeding and to headache, which are, alas, not uncommon during school years. The special causes are different, *e. g.*, that the flow of blood to the brain under those special circumstances is increased, the return flow is rendered more difficult from various reasons. In a girl high school at Hamburg 50% of the girls suffered from habitual headache, 16% from repeated nose bleeding; investigations concerning the home life gave the result that only in one-tenth of the cases influences such as exciting drinks or hereditary tendencies were to be regarded as simultaneous causes. Statistics naturally speak with greater authority if both sexes can be compared.

In Sweden the following results have been obtained :

Number investigated	Habitual headache %	Chlorosis %
11,210 boys	13.5	12.7
3,219 girls	36.5	35.5

When one compares these results with the average daily time for obligatory work one finds that the latter has been lower in girls' high schools in every year than in the boys' schools for the same age. As I mentioned before the Swedish statistics compare boys' public high schools on one hand, and girls' private high schools for the upper classes on the other, for which the work registered is not the same. For results in co-educational high schools we must go again to Finland. The reports of one of the high schools, the Nya Svenska samskola give data as to the causes of non-attendance for the years 1896-1898. The causes for school days missed are as follows:

	Habitual headache %		General weakness %	
	Boys	Girls	Boys	Girls
1897	14.2	31.2	0.6	2.6
1897	13.3	20.6	0.8	6.3
1898	10.1	24.1	1.6	6.1

Thus the girls show much less regular attendance, owing to repeated headache and general weakness, than the boys.

In the small Danish city Naestved there exists a co-educational school, where the non-attendance days of boys and girls were compared. Out of the 250 school days of the year each boy missed on an average 5.8, each girl 10.2 school days.

Gymnastics, by which we mean drill, is obligatory for both sexes in Finland co-educational schools; exemption can only be obtained by a certificate from a physician.

Now Palmberg found in 1890 in the Helsingfors co-educational schools that the percentage of those exempt from gymnastics was as follows:

Out of 1,275 boys 3.06% were exempt, of those 49% were exempt on account of weakness.

Out of 973 girls 11.63% were exempt, of those 65% were exempt on account of weakness.

Similar results have been noted by Lindholm, who in 1900, made his investigation not in Helsingfors but in eight small cities in Finland; in the total number of those towns the percentage was as follows:

Out of 1,921 boys 8.7% exempt, of those 25% were exempt on account of anæmia and general weakness.

Out of 1,427 girls 14.0% exempt, of those 60% were exempt on account of anæmia and general weakness.

There also a higher percentage of girls were exempt, among the causes conditions of weakness being more prevalent. Also the mortality from tuberculosis is higher in Finland among girls than among boys.

Let us now compare the differences at different ages. I can use the Swedish statistics for that purpose, and I select from the Swedish boys' high schools the classical schools only, because they show the greatest morbidity, and thus the difference from the girls' private high schools becomes as slight as possible.

Age, .	11	12	13	14	15	16	17	18	19
% ill, boys, classical school,	34.4	37.6	38.0	37.4	36.6	34.7	38.6	40.5	36.9
% ill, girls, high school,	55.7	59.7	64.8	64.4	63.1	63.9	62.5	(68.6	60.3)

Though I chose from among the boys' schools the classical school with its high percentage of illness, the difference between the boys and girls is striking. In every year the percentage of sickly girls is much higher than that of boys. In both sexes the percentage of sickly pupils increases up to 13. The great relative difference is characterized by the peculiarity that with the boys, at the moment when the vigorous increase of growth arises, which signifies the beginning of puberty, the percentage of sickly boys decreases; whereas with the girls, with whom that development begins at an earlier age, the high rate of morbidity continues for a remarkably long time during that period. In Sweden the mortality of girls from 12 to 16 years old was also found to be higher than that of boys of that age. A further proof as to age and bodily resistance is the following from co-educational schools. In 1890-91 Pipping weighed the boys and girls from 8 to 20 years of age in four Helsingfors high schools in the different terms of the scholastic year. The results obtained in two co-educational high schools with a total of 507 boys and 636 girls show, as far as development can be determined by increase of weight, that the increase during the course of the year is similar for boys and girls up to 11-12 years. Later, during the years of 13-14, with the development of puberty, this increase during the school year becomes remarkably different in the two sexes; with every additional year, it becomes more apparent that the increase in weight amongst the girls takes place principally during the holidays, especially the long summer holidays. From the 16th year upward there would seem to be no increase of weight among them at all during the term, but even diminution was noticed; other results have been obtained with the boys, who showed a more equal increase during the school terms themselves. Those observations show clearly that in such climates with the development of puberty the organism

of girls gives evidence of a physical weakness and a greater sensitiveness to hard work.

I shall not weary you with any more dry statistics. From whatever point of view one looks at the matter so far as reliable material exists, a critical study of European statistics based on physical aspects, shows unfavorable conditions for the girls, with regard to the power of resistance to noxious influences.

It would seem especially that the augmentation of the percentage of girls with characteristic kinds of ill health during the age of the development of puberty merits attention in every way. It is also a well known fact that the time of that change is not only accompanied by physical troubles but also often by a psychical depression and retarded interest and fitness for mental work; and these facts must strike us all the more because well developed, healthy girls, under favorable circumstances, pass through that process of development, which is a *physiological* one, without difficulty, whereas the above named troubles will arise under unfavorable conditions with girls who are not completely healthy, and yet whose percentage is a high one as statistics have shown for the age previous to puberty. The facts referred to are facts with which schools as institutions for the masses must reckon, and the causal connection of the above mentioned troubles with the injurious influences of school life such as continual sitting in bad conditions as to air and light, together with difficult and trying home work is obvious.

With the girls the development of puberty encroaches seriously upon the general development in a different manner from that which it does with the boys; the normal progress of that development is of importance for the whole future life. The first marked sign of the sexual life is only the terminal link of a long chain of natural processes, but from that moment a new great difference of the sexes shows itself by the regular oscillation in the physical and psychical life of the woman.

There cannot be any doubt that the development of puberty in girls represents a process in which hygienic matters have a still higher importance than with boys; therefore in the school régime also, the observance of the rules of school hygiene for the girls should play an important part. It is true, however, that we cannot, up to the present time, find that the schools have taken such special notice of the progress of development of the boys.

Culture has in the last half century conducted, at any rate in the central parts of the European continent, to make the burden for youth in the higher public education continually heavier; however, it is true that a perception that something

may be wrong is gradually gaining ground here and there, but even in the new kind of schools erected for girls it is not apparent that sufficient attention is paid to hygiene.

When we refer to all the material at our disposal we see that with regard to the mental gifts and abilities of girls there are hardly any serious reasons against co-education in high schools, but that their physical state and development speaks decidedly against loading them with such a burden as the boys have to bear now in our European high schools.

Certainly we know that there have been already several women with exceptionally high scientific gifts, and that a remarkable number of girls have gained the knowledge demanded by the high school curriculum under the greatest outward difficulties: but that is no proof that for a number of girls analogous in percentage to the number of boys taking the high school curriculum such studies would be advisable. Let us look at the school history of co-education in Finland. The total number of female university students in Helsingfors was 19 up to the year 1890; in the year 1890-91, that is to say, when the co-educational high schools first held examinations for those leaving, the number mounted up to 150. Now there are 2,500 students in Helsingfors University, out of them 500 lady students, that is to say 20%. What were the female university students going to be? From the official reports of the president a great difference is to be seen between the female students before 1890 and the later ones; the few out of those early days, who were obliged to make headway, were distinguished by a high degree of intelligence and energy; not less than 13 out of the 19, that is to say 68%, finished a complete university course of study with examination; out of the ladies there are at present only 12% who take any examination. Similar results were noted also with regard to the numbers of female students at the Geneva and Zürich universities in Switzerland. There also the results of the final examination went down with the increase of the number of pupils. In Helsingfors before 1890 100% got *Laudatur*, the best mark; 1890-91 55% got *Laudatur*, 7% *Approbatur*; 1899-00 15% got *Laudatur*, 41% *Approbatur*.

Another question in connection with co-education is the morality question; it only touches hygiene, but it is a critical one. In northern Europe, especially in Finland, where, as we have seen, the system has already been in practice for some years, it was naturally remarked that other than comradelike inclinations sometimes arose, but nothing objectionable or improper was noticed. It has been observed in Denmark that the boys in co-educational high schools prefer to choose the lady of their heart from a girls' school rather than from a co-educational one. I do not intend to speak here about

adolescent love, but refer you on this point to the chapter so excellently treated in President Hall's admirable book on Adolescence. I shall only remark that in these northern countries sensuality probably may not be so much developed as in southern ones. During the last years in different smaller cities of Germany and Austria co-education has also been established in the high schools, and we may hope to get by this means knowledge of the results of this system in other European climates also in the course of time. I think that in every case European continental high schools are in many respects differently constituted from American ones.

As everybody knows some other possible psychical influence, which has to do with special secondary sexual characteristics, may be expected to work favorably in its effects with co-education; the girls may learn from the boys to criticise their subjects of study and become influenced by the specialistic tendencies of the boys, they may learn to be more independent and capable of deciding for themselves and get rid of superfluous shyness; on the other hand, the greater refinement of the girls may have a propitious influence on the boys in causing them to cultivate more moderation and gentleness. It may be that co-education will also have a good influence on the views of parents; up till now, girls have not been given enough freedom of mind and body in Europe in consequence of traditional customs.

In every case we must always come back to the fact that the power of resistance is weaker in girls, and their course of development different from boys; there cannot be any doubt that therein lies an important argument against co-education based on the present curriculum in our European boys' high schools. There should be a tendency to give such a character to the curriculum that release from hard work could be obtained at certain times without necessitating a dropping behind in the studies. That is a question difficult of solution.

Notwithstanding all these difficulties, I suppose we shall also have before long a co-educational system in the high schools in central Europe to a certain extent. It is a characteristic feature of higher female education in Europe that first of all private schools for girls have been founded, that money was obtained for such schools from private people, and these schools were expensive ones and accessible only to the upper classes of society. They had a certain freedom as to their curriculum. The certificates naturally had no public, no official value for gaining positions or leading to university studies. Afterwards official curriculums arose, and certificates of the schools thus gained a certain official value; the old private schools now began to adapt their curriculums also to the offi-

cial ones, and new schools arose, again founded by parents, that is to say, undertakings with no financial gain as an object. In the different states of the European continent nothing or relatively small sums only have been contributed from the public funds up till now towards the expenditure on such girls' high schools, though the state reserves to itself the right of approving the curriculum and superintending the education; in return the state gives certain rights such as admission to the universities. Therefore school fees must naturally continue to be high ones. There are exceptions, as in democratic Switzerland, where girls' high schools also are accessible without fees.

Out of the girls attending high schools in Central Europe only a certain number may wish to reach a higher level of mental development for its own sake; the greater proportion of them will probably have to earn their living with what they have learned. The tendency towards the higher education of girls will probably increase more and more for both reasons, and so a good practical solution of the co-education question is not the least important part of the girls' high school question on the European continent.

Now in large cities separate high schools can be run by private enterprise, but if the girls are allowed to attend boys' high schools (which are, with very rare exceptions, day schools and founded by public funds), these girls should pay only relatively low fees, and if they come from poor families, then no fees at all, just as it is in the case of the boys. Further, in small cities a public high school for boys often exists with only a small number of pupils, so that there would thus be plenty of room for the girls wanting higher education, but it is practically impossible to erect a high school in such small places for the limited number of girls in question. It is also a matter of fact that in such small cities, where almost every one knows each other personally, and meets here and there, and in this way a sort of involuntary public control of youth exists, there cannot be so much moral danger from co-education in a high school.

I remarked that with us it is a question of day schools only. As to practical arrangements, it would be first of all sufficient to have separate cloak-rooms and so on for the girls. Further, separate drill, as girls are not so strong in muscle as boys and have less lung capacity; probably, too, they themselves would not care to play football.

The real difficulty lies in the curriculum. I must remark that in our classical high school, which is called "Gymnasium," as also in the modern side of the school, which is called "Realschule," and in other high schools, we have no optional system,

and I don't suppose we shall attain anything of that kind in our high schools at present; only certain subjects are optional outside the course of the already severe normal curriculum as, *e. g.*, singing or stenography, or in classical schools one modern language, or in the modern schools modelling, and so on. I would remark that all these schools begin their work with children of ten or eleven years of age.

The true policy would be that every one should have the opportunity of learning as much as he or she is able to do, without injury to health. As far as we are allowed to judge from all that we know about health and development, it would be against hygienic principles to oblige girls to learn in co-educational high schools everything that boys are obliged to learn in these days. But one could arrange things so that just in those subjects to which the greatest number of hours are devoted each week in school, and for which, therefore, most preparation is required in the home work, the curriculum should be made lighter for girls and adapted in respect to quality and quantity of work, so that the resistance of the sex and its variations in the different stages of development be taken into consideration. Thus, *e. g.*, it would be sufficient in our classical high schools to diminish the Latin and Greek in the curriculum for girls. By this means girls would get rid of a number of school hours and home studies, and could use this extra free time for walks, open air games, skating, and so on. After they had passed through the whole school with the boys they could take the final examination with them also, but at a lower scale for certain subjects. A number of girls would be content with these studies either with or without the reduced final examination; for it may be that they are seeking a higher education only for its own sake, or they are not sufficiently gifted for such an examination, or they do not want to go to a university to get a degree. It is indispensable for those who wish to get a university degree to have passed a complete examination on leaving a high school. Now it could be arranged for those girls who have finished the co-educational high school and wish to get degrees, to study a year or a year and a half longer at a high school, where they would learn what is needful for passing the final examination, at a riper age and with more resistance also because they have preserved a better state of health. In the European continent there would be no injustice in that system because the boys lose more than one year by being obliged to spend that amount of time in military service, or if they are physically unfit, to pay a tax for several years for exemption from military service.

It is possible that such a solution may seem strange from an American point of view; but in old Europe for every public

position, even for a very inferior one, and for the greater number of private positions, certificates are the first requisite and are invariably asked for.

Everybody knows that in the United States co-education in higher schools not only is very general already, especially in certain parts of the Union, but is making further progress, as one sees from the reports of the Commissioner of Education.

In pedagogical matters the scientific experimental method should be much more used and the results studied, especially in Europe where all education is regulated generally in a very decided way by public administration. Trials have been made already with co-education in Baden and Wurttemberg. In the Grandduchy of Baden the Ministry declared that, as the schools have been founded as boys' schools, the number of girls admitted should be limited with no regard to the special features of the education of the female sex. The ministry states that the experience with the girls is a good one. In Wurttemberg, where the boys' high schools are mostly the property of its cities, a number of them have already allowed girls to enter; every city which intends to make the boys' schools acceptable to girls also is obliged to make a special request to the Ministry for such permission. Also in Saxony since Easter 1908 co-education in the present high schools for boys has been started in a cautious way; but in every single case parents must make a special application to the minister of public education.

The resources of nature are quite inexhaustible in all that is wanted for the healthy existence of mankind. We cannot expect that care for the welfare of every individual should arise from love for one's neighbor; but hygiene shows that unhealthy conditions in one class of people may have dangerous consequences also for others, even if these live in the most favorable circumstances. So from reasons of self-interest alone progress may be made for the good of all. Practically man as lawgiver has not taken enough care of women. In a low state of culture he often treats her as a slave, whether she is forced to perform the hardest work or to live the confined life which is the lot of Mohammedan women, and even in highly cultured European states one hears a great deal spoken about the lower resistability of woman; but it is admitted at the same time that she does the hardest muscular work day and night in earning her living, and that women in public positions are paid at a lower rate than men and not allowed to attain the same positions, though they do the same work. I feel sure that in the centre of Europe the cry for the higher public education for girls and consequently for co-education, arose first of all because families who lived in good or tolerable circumstances,

through the wages of the father, looked in despair on the future of the daughters. Ensure to all poor girls the means of earning their own living and the tendency towards higher education will have another character.

We cannot, however, deal with Bellamy in practice. There is no doubt that co-education in high schools is a difficult question in various ways; from the hygienic point of view, because resistability as a whole and the variations especially are different in boys and girls, and the states of morbidity acquired by girls at the adolescent age so often continue in the future life of the woman and consequently may influence future generations also.

Co-education should be considered everywhere as an important public matter, and the higher education of the female sex should have regard not only to advantageous knowledge but also to physical soundness and improvement.

THE MAIN PROBLEMS OF SCHOOLROOM SANITATION AND SCHOOL WORK

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The schoolroom deserves special consideration, because the pupil is obliged to be in it during the greater part of his daily work in school, and to do his lessons there under conditions likely to become objectionable from a hygienic point of view.

Light, air and correct positions are the main points to be considered, and for the reasons just mentioned the schoolroom merits the first attention when planning the house.

As to the dimension of the room, the cubic air space is the more favorable the greater the room in relation to the number of pupils. How many pupils are to be instructed together in one room is, alas, a financial question. Practically, one could put a greater number in one room if the latter were relatively big enough, but it must be borne in mind that there is a difference between universities, *e. g.*, and schools in a stricter sense of the word.

With respect to pedagogy, each pupil's share in the teacher—if one may say so—becomes less, the greater the number of pupils in the schoolroom, so that the enormous advantage of being taught with others instead of being taught alone has also a limit in a pedagogical sense. Further the pupil's range of ear and eye is limited, and the question is important with regard to the hygiene of the teacher, whose nerve-destroying work increases with the number of pupils and the strain upon whose voice varies according to the dimensions of the room. Nervousness and diseases of pharynx and larynx contribute in a prominent degree to the statistics of the ill-health of teachers.

Taking all these points into consideration, it would be better for the schoolroom to be not more than about 30 feet in length. The breadth of the schoolroom should be determined from a pedagogical-hygienic point of view; because rooms too great in breadth render it more difficult to see all the scholars at the same time; and of special importance is the breadth with regard to light.

The aspect of the schoolroom windows is an important matter, a southern exposure commanding much better light than a northern one, and a temporary bathing of the schoolroom in sunshine being of value for the health in different ways, *e. g.*,

in consequence of the bacteriacidal influence of sunlight. As far as circumstances allow choice of aspect, it will be also of importance when making the decision to consider whether the climate is warm or cold, whether pupils are robust and well nourished or frequently feeble and anæmic, and so on.

Much time has been bestowed on experiments with persons of normal eyesight, who read printed matter quickly, to find out the minimum amount of light needful for a school-desk. We now have photometers, by which we are enabled to measure the intensity of the light which is reflected from the desk itself, while formerly one could only measure the intensity of the light of a self-lighting object. Further, let us imagine that the greatest circle of a globe is divided into 360° and over every such degree a square constructed, then we have what is called "square-degree" (Qg.). The whole celestial globe has more than 41,000 Qg. Now instruments have been invented by which it is possible to measure how many Qg. send light to the pupil's desk in question; since the angle of the ray is also of importance, one must reduce the Qg. to a horizontal plane and get by this means the reduced area-angle, the "Raumwinkel." R. W. Pleier, of Karlsbad, Austria, has constructed a practical instrument by which one can measure the area-angle without being obliged to reduce it. A photograph is made simultaneously with the reduced square degrees.

Now it is possible to find out in a scientific way, by means of such instruments the exact amount of light which falls on a school desk; but if there is not light enough then the scientific statement of the fact will in almost every case be of no practical consequence, because it is too difficult and too expensive to make alterations in a house already built. Therefore it is of importance that the right amount of daylight should be guaranteed when the house is first being planned; for that purpose more or less complicated calculations have been proposed, so that 25 meter-candles (10 in red light) or the 50 reduced square degrees or area-angles may be secured. Such calculations, however, will only be made in exceptionally rare cases, and therefore I should rather prefer to have resource to a simple method which can be used by every private architect, even in the country. Let us imagine a vertical section of the future schoolhouse so made that the section is perpendicular to the front of the schoolroom and the street, and the sketch of the house which is or can be erected opposite to the schoolhouse. Now we mark in the schoolroom the top of the desk which is furthest away from the window; we draw from that place one stroke which touches the upper edge of the schoolroom window which is opposite to the desk, and a

second stroke which touches the top of the roof of the building opposite to the schoolhouse. By that means we can see immediately whether any light at all from the sky falls directly on to the desk in the worst position on the floor in question; if direct light reaches that desk, the room will do. Insufficiently lighted rooms will be found chiefly in the lowest stories; to avoid this schoolhouses must be built at a greater distance from the opposite house, or the lowest floor must be used for other school purposes than schoolrooms, or it could be let. If possible, it is better for the schoolroom not to face the street, but a big courtyard or a garden, where there is less noise and dust, so that windows in summer time can remain open during school hours. The proposed plan is not strictly scientific, but it must be observed that up till now the results obtained from scientific investigation as to the necessary amount of light have not always been found to be incontestable.

In every case the strongest light must come from the left side, otherwise shadows from parts of the body fall on to the paper when the pupils are writing. Intensity of light decreases rapidly with the distance of the desk from the window, and we also see that the intensity of light depends on the height of the upper line of the window, and therefore also on the height of the room itself, which it would be better not to make less than 13 feet (4 m.), if the room is 19 feet (6 m.) broad.

From this it also follows that windows should reach up to the ceiling and that their upper part should not be shaded by curtains when they are not necessary. Architects do not always comply with the request that windows in schoolrooms should be separated only by very small mullions and the top of the window should be horizontal; they sometimes prefer Gothic windows, and the like, but they make a great mistake. We like a table nicely decorated for dinner, but the main thing is to have good and sufficient meat and drink—"panem et circenses," not *vice versa*. The right problem of art in those things made for practical use can only be how to embellish them after the needs are satisfied. And experience shows that an architect can quite well make a schoolhouse look nice, even though he respects the requirements of hygiene.

It is a pity that in schools, artificial lighting also must often be used. Though progress in artificial light has been enormous during the last 25 years, in many schools over-heating and the production of noxious gases are still only too common, and another and very fertile cause of injury is to be found in the shadows caused by artificial light. A schoolroom may be excellently lighted so long as there are no pupils in it, but when pupils sit down, a number of them may have to work in

deep shadows from head or body. One may then find by measuring that perhaps only six per cent. of the light which should fall on the desk is actually at the disposal of the pupil who is sitting there. To avoid this evil, Jaspar, of Paris, in 1881, invented a device for artificial diffused light, without shadows, the light being directed first of all by shades to the white ceiling and white upper parts of the walls, and being given back from innumerable points of reflection as a diffused light. The light may be quite excellent when the lamps are first installed, that is to say, sufficiently strong, but in cities with much dust and soot the ceiling and the upper side of the shades become dirty very quickly and get covered with dust. As some trouble is involved in climbing up to see whether there is dust on the shades, servants do not bother themselves about it, and the headmaster will certainly not mount a ladder to see if the servants have done their duty. It is now preferable with electric light to fix the lights directly on the ceiling, so that the light is as far away as possible, and therefore the shadows are less deep.

When the lighting is unfavorable bad positions are inevitable, and thus respiration, circulation, digestion, and eyesight become impaired.

As there cannot be too much diffused light in a schoolroom so we cannot change the air too much, but annoyance from draughts must be avoided. If we compare the amount of air space in private rooms for one person with the amount in a schoolroom, we see immediately how unfavorable the conditions are in the latter, even when not crowded. To improve the air one could make the cubic space per pupil greater by increasing the height of the room; the increased height would not make speaking and hearing more difficult, but such rooms are not so easy to heat. It has been generally supposed that the products of the respiration and perspiration contain poisons also, and much effort has been made to discover exactly what those poisons are; but it has not been possible to ascertain their chemical quality, therefore much less their quantity. But it would be probably not quite right to conclude from this fact that such substances cannot exist, and do not work injury. We have known, *e. g.*, that the springs of Gastein in Europe have a wonderful sanitary power, but chemistry could find no special substances to explain the fact; since radio-activity has been discovered it has also been found that the Gastein water is radio-active—it may be that therein lies the reason of its sanitary power.

The father of hygiene in Europe, Pettenkoffer, supposed that those indefinable noxious substances, produced by respiration and perspiration, increase in proportion to the carbonic acid

produced by men, and therefore the quantity of carbonic acid in the air would be a means of measuring the quality of the air. So much is sure, that the carbonic acid produced solely by the presence of people in a room is a means of judging the quality of the air, because the air exhaled contains a hundred times more carbonic acid than the natural air inhaled, and, with the increase of carbonic acid in the air breathed into our lungs, that air approaches more and more to the quality of the air exhaled, so that diffusion in the lungs must become less and less. But Pettenkoffer considered one pro mille of carbonic acid as the maximum which should be allowed in the air of a schoolroom, and he came to that conclusion because he found that then the air smelt foul in consequence of the unknown substances produced by human beings at the same time as the carbonic acid. Now that conclusion is false, because the smell of air depends not only on respiration and perspiration but in a great degree on the cleanliness of the bodies and linen of the people themselves. There seems to be some degree of mystery in the air question. But very interesting is the fact that Weichardt has found the poisonous "Kenotoxin" in the exhaled air, also.

Every care should be taken to keep the air of the schoolroom as free from dust as possible; in the first place not to introduce dust and secondly not to produce it in the schoolroom.

There cannot be any question that we must do our best to ventilate the schoolroom, even if we cannot prove sufficiently in a scientific manner the existence of self-poisons in the air.

In every case it is necessary that the windows of a schoolroom should be made to open wide and without any difficulty, so that the pupils themselves can open them. I do not as yet know of an ideal schoolroom window for cold climates. If the breaks between lessons are not too short, let us say at least of 12 minutes' duration, one can use the windows for abundant and quick ventilation even in winter time in temperate climates. The caloric capacity of air is very low, but the walls and the furniture contain much warmth and lose only a trifle of it if, *e. g.*, on a cold winter day, all the windows are opened for a minute or two, and the greater the difference is between the temperature of the schoolroom and the air outside, so much the more quickly is the air in the room changed and renewed; and the remaining time of the recess will be sufficient to make the fresh air warm, which has come into the room.

The use of windows for changing the air is of a certain educational value in the country; we have a facetious proverb in Europe to the effect that the air in the country is good because the peasant never opens the windows of his dwelling.

The usual method of ventilation is what is called in English the "natural system;" the air from outside is conveyed through a channel to a space between the stove and its mantle, and an opening in the wall of the schoolroom allows the foul air to enter a flue which conveys it out of the house. The difference of weight and therefore pressure of the warm air inside and the cold air outside makes air move like liquids of different weight in communicating tubes. The system is of value; but it is not sufficient because its working depends on the difference of the temperature of the air inside and outside, and so for the schoolroom the ventilating value of the system depends on the greater or less heating of the room, and the effect decreasing with diminished heating, though the necessity of ventilation is always the same. It would be a help to heat the foul-air flue when the schoolroom itself is not warmed. Still less reliable is the apparatus for ventilation by which the pressure of wind can be utilized; since this pressure is a continually fluctuating one. The best method is the plenum system, but it cannot be introduced in every country schoolhouse.

Much progress has been made in recent years in methods of heating; a very easy regulation of temperature can now be obtained in many schoolrooms by central heating. But we must not forget that man is a warmth-producing body and he must lose the surplus by radiation, vaporization and conduction of heat; now in the schoolroom, in the neighborhood of one such warm body are other warm bodies, which must also lose their heat. Therefore, schoolroom air must not be too warm or too moist as we shall see from the following experiments. In Flügge's laboratory experiments have been made with a man enclosed in a small glass room under differing conditions of warmth and moisture and percentage of carbonic acid in the air. Similar experiments have also been made with pupils in a schoolroom. If the carbonic acid increased up to 10 to 16 pro mille, but the temperature was below, sometimes far below 68° F, and the relative moisture was not higher than about 47-72 per cent., the person felt quite well, although the chemical composition of the air was in an appalling condition and the experiment lasted from three to four hours, but if the temperature was raised to between 68 and 86° F., and the relative humidity was 47-92%, then symptoms of illness such as giddiness and so on arose, even after 10 to 13 minutes, though the carbonic acid did not reach more than 13 pro mille. There cannot be any doubt that the retention of warmth in the bodies of pupils in the schoolroom must be avoided, but I do not think we ought to conclude from these experiments that pure air in schoolrooms is superfluous.

For a long time the greatest problem of school hygiene has been the school desk, and it is so still. It may be somewhat audacious to speak in the United States about this matter, since Barnard in his article on school-architecture in the Connecticut Common School Journal, as far back as 1838, was the first to speak sanely on the question. Since that time American and European authors have occupied themselves with the problem as, *e. g.*, Hartwell, Porter, and Scudder in the United States. The first essential of a good school desk is that it should permit of healthy positions. While certainly one can sit in malposition at a good desk, in an objectionable one pupils are forced to sit badly. It is necessary that the desk should have the right dimensions, and that it should give some freedom of movement also. Otherwise the most important bodily functions, such as respiration, circulation and digestion, are obstructed, and pathological curvatures of the spine are produced. Purely pedagogical and economical questions also are of importance. Single desks, such as are in use in the United States, and also in England and Sweden, are preferable, because they diminish dangers of infection and pedagogical difficulties.

I had already occupied myself with school hygiene for some time before I thought that the desk I used myself for many hours a day, might not be the best from the hygienic standpoint. In fact, the seat was too high and my feet did not quite reach the floor; therefore I cut the legs shorter. Now the desk itself was too high and I cut its legs shorter so that, when my arm was hanging vertically, the elbow was just the same height as the desk. Now, as I could not get my own legs beneath the desk, I took out the middle drawer and cut off a piece of the drawer, and now I was able to get my seat so far under the desk when writing that the distance from the edge of the desk to the back of the seat could be made almost as great as the sagittal diameter of my breast. Now my work was quite a different matter, much more healthy and agreeable, too. There may be ladies and gentlemen in the audience who do not sit hygienically at their own desks, though they are interested in the hygiene of their pupils. "Charity begins at home," and therefore it is well to begin reform on ourselves first.

We can place our seat further back when reading, *e. g.*, and the pupils need not always sit as near the desk as is correct for writing. Therefore school desks should be made with movable parts, and they must also be adapted as far as possible to the individual height of each pupil.

The conditions I have sketched in a cursory way are those necessary for every school; but the movable desks can

be omitted in country schools; for it is important for village schools to get desks cheap, and the total number of daily school lessons and of school years is lower than in high schools, also country children are more occupied in the open air and do more bodily work in general, so that their muscles are more strongly developed.

There are two means of getting desks suitable from the hygienic standpoint. One can choose desks of different sizes or make the desks adjustable to the varying size of the pupils.

It is a pitiful fact that in many cases no trouble is taken over this matter except that the carpenter receives the order to make the desks, and nobody cares whether the sizes he furnishes are suitable for the pupils. A good model may be chosen, but no one bothers his head about the details which are equally important. I have made an investigation concerning the desks in every Austrian high school, numbering about 300 with nearly 100,000 seats, and the results have been pitiful; for it is a sad fact that in five-sixths of all the high schools the whole work of hygienists and technical experts has been done in vain. I feel sure that in many European states the result would be no better in this respect.

As the unadjustable desks are made so that every special size is planned for a stature within certain limits, I proposed many years ago that the manufacturer should make a lathe, marked not by inches and centimeters, but only by stripes signifying the height-limits for pupils, who should be seated in the corresponding sizes of desks. In this way can be found out in a few minutes how many desks of each size are required for a given schoolroom. As the size of scholars in a classroom varies every year and the pupils grow taller during the year, it would be a good plan to measure the pupils half-yearly during several years before supplying the new desks and to buy also an extra number of desks for exchange and put those not wanted at present in a storeroom in the schoolhouse. Further, as the size of pupils sometimes varies considerably within small geographical distances according to race and standard of life, it is better to make such measurements in every case, before a school is to be furnished with desks. In villages where conditions are of the simplest and great outlay is impossible, nothing can be done, except to buy what is necessary for the average requirements of the pupils after the measurements referred to above have been taken. Place the desks so that the lowest are next to the teacher's platform, and the higher desks in graduated rows behind; to seat the pupils, first arrange them standing according to their respective height and then place them in the

graduated rows of seats. To be sure, that is not the best way of seating, but the best way under such circumstances.

It is difficult for a country carpenter to make suitable desks in different sizes. A teacher, Walter, of Dornbirn, Vorarlberg in Austria, has found a practical solution of the difficulty. He sells a drawing in which all the different sizes of a simple double-seated desk are shown according to scale, in such a manner that every simple country carpenter can make the desks correctly with the help of this drawing. The drawing costs about two dollars (10 crowns Austrian value).

All desks not adjustable have the disadvantage also that they must leave out of consideration relative individual differences; there are pupils thick and thin in body, those with relatively long and short legs, and so on. In every case adjustable desks are the best, if one can make sure that the adjustments are made, but they are naturally expensive. It is more economical to have only a certain percentage of adjustable desks in the schoolroom, as, *e. g.*, has been ordered in Brooklyn, where 33 1-3% of adjustable desks are ordered for a schoolroom. So far as I know only the United States and Great Britain up to the present time, are so far advanced that adjustable desks are in use in a considerable number of schools.

It is also of hygienic value that desks should not make it a difficult matter for the floor to be thoroughly cleaned. The different arrangements possible for that purpose are first that the desks should only touch the floor at certain points, a means used with simple desks in France first of all I think, or, secondly, that they should be reversible, this kind being first used in Lausanne in 1887, or, thirdly, that they could be moved on castors, so that whole rows of double desks can be easily removed in this way; this kind was first introduced in Europe by Zollinger in Zürich, in 1900, and is the most practical plan for such desks in my opinion.

The most objectionable occupation at the school-desk is writing. Unfortunately, when we write at the desk we must always bend the head somewhat. It is also necessary to observe certain positions of the body, hands, and so on.

I shall not here enter into details, but so far as my experience goes, I consider that the training of children in such matters, when they begin to learn to write in school, is generally too much neglected, because it would naturally cost time and trouble, and because it is a complicated matter for children to learn to write in a correct way; but the labor is well worth the trouble it involves.

Writing should at first be constantly interrupted at short intervals, whenever it is seen that the children are fatigued.

Much has been written about the question as to whether upright or slanting writing is preferable in school. The question is very difficult to solve in a scientific way, because different attitudes and movements of the eyes, the head, the fingers, the hand, the upper part of the body, and the pelvis must be taken into consideration; and because it is a question not only of the strokes with the pen but also of the continuation of the lines of writing, and because the manner of holding the pen, the quality of the desk, the varying bodily strength, and the previous training in writing complicate investigation.

We will imagine that the exercise-book is lying on the desk straight in front of the body, so that the lines in it are parallel to the edge of the desk; if I now make a down stroke I move the pen towards the bisecting line of my body; the down stroke is perpendicular to the line in the exercise book. That is the so-called upright writing.

Now suppose I lay the exercise book again in front of my body, but this time aslant so that the lines slant upwards from left to right. If I now make a down stroke I again move my pen towards the bisecting line of my body; the stroke is slanting to the line. Now I have the slanting writing.

In both cases the exercise book is in front of the centre of the body, and we see that as to the formation of such a down stroke, eyes and hand have to perform just the same work whether the writing is upright or slanting. Then, if a different influence on the bearing of the body by the two methods of writing exists, it can only be sought the direction of the lines in the copy-book, that is to say in the continuation of writing.

It is to be seen from Schubert's observations and those of others that with slanting writing the head is much oftener turned to the left or inclined to the left than with upright writing. Now we will imagine that head and body may be held quite correctly, only the head is inclined somewhat downwards and the centres of the eyeballs may be joined by a line which we will call the base line. If I now put the exercise book before the centre of my body, as I did for upright writing, and I look at a certain point of a line in the copy-book then a plane is given by three points, the two ends of the base line and the point I am staring at; that is the "plane of direction." If we now imagine that the base line glides down in the plane of direction we see that line fall in the direction of the writing line. Now we place our exercise book in front of us, as for slanting writing, and look at a certain point of a line, *again* without turning the head or body or inclining them to one side.

Let us again imagine that the base line glides down in the

plane of direction. We see now that the projection of the base line in the plane of direction crosses the writing line.

Now I will incline the head to the left, so that the right end of the base line is higher than the left. In that way I can give to the base line such a position in space that its projection in the plane of direction meets the writing line at the same slant. If instead of inclining the head to the left I *turn* it to the left, so that the right end of the base line comes forward, I can find out such a position of the base line in space that its projection in the plane of direction joins the slanting writing line anew.

We see that we reach the meeting point of the base line in upright writing without being obliged to turn or to incline the head sideways, and in slanting writing if the head is turned to the left or inclined to the left. Now observations on those pupils who write aslant show that the prevailing number have their head turned or inclined to the left, and the higher the class is, that is to say, the quicker the writing, so much more is that fact noticeable; from these facts we can conclude that there is a tendency on the part of the writer to give such a position to the base line, that its projection in the plane of direction becomes the same as the writing line; now if pupils incline or turn the head sideways it is a natural consequence that shoulders will follow suit; therefore upright writing would be the more desirable the quicker the writing becomes, because the influence of the slanting direction of the lines must then become greater. With the small abecedarians who write one letter after the other quite slowly, that influence cannot be a great one.

But the inclining of the head to the left can also be caused by another reason. If I sit in a correct position, but hold my pen too near the nib I cannot see what I am writing; therefore in order to see I incline the head to the left. For the abecedarians the manipulation of the pen is naturally less difficult if they hold the pen close to the nib, and therefore they often do so, and the origin of many bad positions can be traced to this cause, but very many are also due to the want of change of position, to fatigue, and to a lack of correct instruction at the commencement of learning to write, and to bad desks, as I said before.

What we have discussed seems to speak decidedly in favor of upright writing. Now writing is a unilateral occupation. If I rotate my forearm at the point where it touches the desk I describe a curve whose radius is given by the forearm and the hand on the desk; and if I rotate my hand at the point where it touches the table, I also describe a curve whose radius is shorter. Both those curves mount upwards from left to right,

and the chord of that curve shows the direction of the slanting writing line. Thus I can write a good part of the line quickly without much trouble. If I employ upright writing, that is to say, having lines parallel to the edge of the desk, I can only write quite a short piece quickly, because I must shorten the hand *itself*; after having written that short piece I am obliged to move the hand and forearm further and further along. Therefore, for quick work slanting writing is preferable.

The historical development of writing is characteristic. From old pictures, from initials in illuminated manuscripts in which the writer is depicted, as well as from old documents, it is to be seen that writing was formerly upright; from the beginning of the 16th century the change from upright to slanting writing is to be found in manuscripts, the probable reason being that the need of writing more quickly has given the impetus in that direction.

Less critical than writing is reading, because pupils can hold the book in their hands and can also prop it against the edge of the desk, and the body can lean against the back of the chair; it is more difficult to use the back in writing. I once collected primers from different countries, and I found no other primers so beautifully gotten up as to print, etc., as those from the United States. Very valuable investigations concerning the hygiene of printed matter have also been made.

I remember the investigations of McKeen Cattell, and of Sanford, which together with those of Javal throw much light on the subject. I apologize for not quoting American literature more frequently in my lectures.¹ As to school books, the late Hermann Cohn made many experiments regarding the legibility of print, and arrived at certain definite minimum demands as to the thickness of the strokes of letters, their height, the distance of one from the next, the distance of successive lines one from another, and so on. He constructed a simple apparatus by the help of which one can quickly find out whether a book is printed properly according to the norms of hygiene. A square is cut in a piece of cardboard, the side of which is one centimeter long and two adjacent sides are divided into half millimeters. Not more than two printed lines should appear at the same time in the square, if it is placed over a printed page, not more than seven letters in one of those lines, and so on. The directions for use are printed on the cardboard itself.

¹ Much literature on this and other subjects on School Hygiene may be found accurately quoted in the "Handbuch der Schulhygiene," by Burgerstein und Netolitzky (Jena, G. Fischer, 2d edition, 1902).

One might say that writing and reading and school-desks would be less harmful if young people had stronger muscles; for then bad positions in school or for school work at home would certainly be less injurious. But there cannot be any doubt that we must try to get the hygienic conditions of the schoolroom and work done in it as perfect as possible, not only in order to secure conditions conducive to health, but also to foster in children healthy habits and ideas, that later they may become public-spirited citizens, ready to help forward to the best of their ability all wise and broad-minded schemes for the furtherance of the hygienic education of the nation.

SOME REMARKS ON THE RELATIONS OF BODY AND MIND

By PROF. LEO BURGERSTEIN, Vienna, Austria

The disposition and development of body and mind cannot be regarded as independent of each other, but the views concerning the importance of the relations in question have not always been the same during the progress of the human race, and in particular the ideas concerning the importance of the body as a receptacle of what is called mind have changed with the course of time. The standpoint of the moralist is different from that of the man of science, though neither will deny that the closest relations exist between them. While in a by-gone period of culture a harmonious development of the bodily and mental gifts has been regarded as the ideal of education, in certain phases of the Middle Ages in Europe the body was considered as an unworthy receptacle of the mind and it was extolled as a virtue to suppress as far as possible all efforts for the highest possible physical development.

Theoretically such a view is spurned to-day in all civilized countries by almost every one, but practically we suffer even now in different ways from the sad consequences of the singular ideas of a time fortunately past, and as we may hope never to return. Even to-day in Old Europe it is only by slow degrees that we approach the goal of an ideal education adapted to modern life and different climatic conditions.

Everything we do is necessarily connected with transformation of organic material, and there is hardly another organ which requires for its activity such a quick change of matter as the human brain does. It is a fact known to everybody that soldiers toward the end of forced marches continue to march in a state of sleep, so that in consequence of exhaustion the work of the brain is almost *nil*, but notwithstanding, in that unconscious state the muscles continue to accomplish movements whose total value, if measured in kilogrammeters, would be shown to be a big one.

Fatigue cannot be avoided, it is a physiological phenomenon, physiological that is to say within certain limits, and even the baby to whom no work is intrusted becomes tired and finds relaxation, nay, more than that, growth in sleep and nourishment.

One regards fatigue to-day as a result of change of matter, as a consequence of chemical processes, of a consumption of organic matter to liberate energy, whereby products of decomposition like lactic, carbonic acids and so on, are formed. These or more probably other products of change of matter operate with paralyzing effect upon the further ability to work; which could perhaps be developed anew by the consumption of still more organic material. Weichardt has at last found a specific fatigue toxin, the kenotoxin, which, according to his statements, exists even in the air exhaled, and he was also able to obtain the retardin as antitoxin to the kenotoxin.

I shall not waste your time with trying to criticise the different methods of testing fatigue, whether it is a question of psychological methods like those of reckoning, memory, combination-work, and so on, or whether it is a question of physiological ones such as the ergographical test or that with dumb bells and foot exercises, or Gilbert's tapping tests on a telegraph key, or those of measuring the changes in the acuteness of the senses like seeing, hearing, tasting, of the times of reaction, and so on; neither shall I speak about the relative applicability of the different methods for experiments under school conditions; only permit me to remark that, setting aside that question and that of the value of all those methods, it will be very difficult to arrive at conclusions of a general validity for educational purposes, because not only are the subjects taught so varied, the types of scholars so dissimilar, but also the teachers, preceding work, influence of suggestion, interest and so on are so different in every special case; and in addition to all these, the probable daily and yearly fluctuations in the ability of the organism, quite independent of work, will also influence the results.

If we add to all this the results when one method is controlled by the other, as in the observations of Thorndike or Ellis and Shipe, then we must acknowledge that we have many reasons for being cautious in generalizing from conclusions drawn from single experiments. Nor shall I quote the latest observations of American authors, which are probably well known to you, such as the valuable contributions of Burnham and Wells.

There can be no question about the fact that exercise of the faculties brings about better regulations of compensation, but it is of the utmost importance that work should not be continued until complete exhaustion ensues, and that it should be followed by the necessary rest. Certainly fatigue within physiological limits does not diminish the ability to perform work, and after the needed period of rest is at an end, ability increases

by the exercise of one's powers, but no skill is gained by work done in a state of fatigue; on the contrary it sustains a loss.

When fatigue increases to such an extent that it is no longer compensated for by the amount of rest which immediately follows, then for the young begins what we call "overburdening." Weariness as a subjective sensation of a general state of the organism is no measure of the degree of fatigue, but it is an important warning which should not be overcome by a strong effort of the will or by chemical stimulants. When tired children are obliged to continue work they instinctively rebel.

It is easily understood that these physiological principles are valid for bodily as well as for mental work. But it is very difficult to draw a sharp line in every single case between physiological and pathological fatigue, that is to say, fatigue pure and simple and overwork, and still more difficult to draw it in general, *e. g.*, for a school-standard; but in every case one can demand, in the interest of the healthy development of the young, that full time for repose be given from one day to the next, because it is of the highest importance that sleep should be sufficiently long and sound, since youth has not only to make good the loss of energy, but also to build, or store up a surplus of material for growth of body and mind.

Physiology has succeeded in proving accurately that certain qualities of brain-work are localized in certain areas of the cerebral cortex; it is to be hoped that further investigation may supply us with more of such facts, although for complicated mental work the task would be indeed a very difficult one. But in every case we shall be at fault if we allow the doctrine of localization to lead us to the idea of giving rest to the brain by change of work. On the contrary, we must bear in mind that considering all we know about fatigue as a consequence of the change of matter and of the accumulation of certain substances in the blood, it must be regarded as a general state of the organism, and that therefore the available local fund of energy is just as quickly exhausted. In extreme cases even common experience shows that clearly; if we are tired out by physical exercise, by a stiff mountain climb or walk, *e. g.*, we feel that we are not fit for hard mental work; and after being thoroughly tired with mental work, we certainly shall not be likely to recover by playing in a football-match.

There was a time, at least in certain parts of Europe, when it was proposed to augment corporal exercise for school children as a compensation for brain work, with the purpose of giving rest and recovery by that means; how unjust such an idea was is shown by all we know about physiology. Special investigations by different methods have also been made on school children, and all these experiments have shown the

same result. I shall only refer to one example from the interesting investigations of Teljatnik, of Odessa, who tested school girls 9 years old. The daily time-table was as follows:

Lesson	9 h. (Ist exp.)	till 9 h. 55 min.	.	5 min. recreation
—	10 h.	— 10 h. 55 min.	.	5 min. —
—	11 h.	— 11 h. 30 min. (IIId exp.)	30 min. —	(principal recreation time)
—	11 h. (IIIId exp.)	— 12 h. 55 min.	.	5 min. recreation
—	1 h.	— 1 h. 55 min. (IVth exp.)		

The experiments were performed in order to test the condition of mental ability for work. The tests consisted of the following among other things: the ability to work out different kinds of sums, the ability to retain in the mind numbers and words and to remember numbers and words. I shall not go into details in regard to the ingenious method used, but only say that for judging the condition of ability for reckoning it was noted what percentage of all the calculations made were right and for the ability of retention and recollection, what percentage of the words and numbers were reproduced right. The average result of all these three tests Teljatnik called the "ability for work," and with these results we shall occupy ourselves for a moment.

It was the custom in the school for the girls to do what they liked in the long break; some of them jumped about and played for a longer or shorter time during the recess, others sat and talked, quite at their ease. Now on three of the days on which experiments were made every game with active movements was forbidden; on three other days all the girls were obliged to play such games.

The initial disposition of the children was naturally not quite the same each day at the beginning of the experiments, and the average results on the three days were as follows:

Ist exper.	79.6	.	.	.	.	77.2
IIId —	72.2	.	.	.	.	74.8
Main break without active games				Main break with active games		
IIIId —	76.6	.	.	.	.	71.1
IVth —	73.8	.	.	.	.	70.2

So we see that the average for the days without active physical exercise shows that the ability for mental work went up after the main break from 72.2 to 76.6, and on the days with active games the average fell from 74.8 to 71.1.

Now I find in the detailed tables of Teljatnik that on the three days with active movements the games lasted on the first of those days 10 min., on the second 23 min., on the third 20 min. If I look just at the IIId and IIIId experiment, that is to say the experiments before and after the long recreation, I find the following figures:

Without active games in the principal recreation time

	1st day	2d day	3rd day
IId exp.	71.5	74.5	70.6

Principal recreation time

IIId exp.	78.6	77.2	74.0;
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On each of those days the ability for mental work rises.

With active movements in the principal recreation time

	1st day	2d day	3rd day
IId exp.	63.5	81.2	79.6

Principal recreation time

Duration of the games:	10 min.	23 min.	20 min.
IIId exp.	70.2	71.2	71.9

Here the ability for mental work goes down on the second and third day with 20 min. and 23 min. of active games, on the first day with only 10 min. of lively muscular exercise, rest from such exercise for a longer time followed, the result as to ability for mental work was no longer a lower but a higher one than before.

Here is shown by a pretty experiment of a single case, what we might expect *a priori*.

Mobility is a sign of health in children; they have a natural tendency to corporal movement; certainly if a healthy education is what we are striving for, we cannot possibly approve, from a physiological standpoint, of children sitting through a series of hours with no rests or only quite short interruptions. Even for boys and girls in high schools this practice is not to be recommended. It is necessary in every case that children should have rests between the lessons, in order to restore the want of balance in the muscular system, to improve the respiration which was retarded during mental work, to stimulate anew the circulation, because great blood vessels were unduly pressed by sitting, by bending the head, and so on, because active hyperæmia with sooner or later injurious consequences is caused by the continued mental work, and circulation is reduced by the superficial respiration. Even being obliged to sit for a long time on the seat which has become warm, is in itself unfavorable in certain respects. Therefore it is desirable that all scholars should have the opportunity of moving about even in the so-called "rests"—although on the other hand, it is clear that active movements of the great masses of muscles produce fatigue, which will not be favorable for the mental work to follow. Certainly we shall not give antidotes to the fatigue-toxin to the school children as a remedy, neither shall we make them chew cocaleaves, as the Indians of South

America used to do hundreds of years ago, when they performed the enormously fatiguing labor of traversing the Cordillera, in order to transport merchandise to the seacoast. If exhaustion of a store of organic material is marked by fatigue, and we endeavor to remove it by a specific anti-toxin, then the work would probably be done at the cost of further existing organic material; such a proceeding would be dangerous for any one who has to accumulate new material, although such drugs may be justifiably used in exceptional cases by adults, if urgent necessity should force them to do so. Neither can I approve of compulsory drill, which is already beginning to be in vogue here and there for scholars during a part of the short rests such as we have generally in central European schools. Drill exercises require energy of will and attention in every case, that is to say they employ the nervous centres in a large degree. For the *mens sana in corpore sano* it would probably be the best plan to interchange brain and muscle work more frequently than is done at present, but after every one of those exercises rest is needful. To find out the average optima for every age and every grade of schools in such matters would be a task for the experimental hygiene of instruction, but there cannot be any question as to the principle involved, and it was with a definite purpose that I recorded Teljatnik's experiments, to prove that there may be ways of finding out the best practical arrangements.

Then also in European continental schools the rests between the lessons are frequently spent in anything but a hygienic way. Often the children in the lower schools are obliged to sit in the schoolrooms during the breaks, or when they are sent out, especially in high schools, one may see pupils leaning on the walls in groups talking over their tasks, or stooping with their heads bent over their books, looking over lessons for the next school hour. It should also be a matter of education to teach the young how to rest as well as how to work.

I shall touch on another significant question in the relations of bodily and mental work. With regard to change of work and rest, it would certainly be a good plan to have part of the lessons in the forenoon, and part during the afternoon. This is more easily managed in boarding than in day schools. People are accustomed in many European countries to eat only a very small breakfast, and, in fact, children often have only a small cup of cocoa with a little white roll, then a heavier meal as soon as they return home from school. Now it is a physiological fact that there is a strong flow of blood to every hard-working organ; the consequence is that after such a dinner the intestines are richly provided with blood, and the brain is

by no means sufficiently nourished for its work. Everybody knows the corporal and mental lassitude which results from such a dinner; if one overcomes that feeling by an impulse of will, and works energetically, one notices that the digestion is impaired. Now the process of digestion in the stomach lasts for some hours after such a meal, and the total pause between forenoon and afternoon school is generally about two hours, during which time pupils must go from and to school. The pupils in high schools especially after dinner are already under the exciting influence of what is expected of them in afternoon school, but it is also a very usual thing for them to repeat immediately after dinner what they are likely to be asked in the afternoon lessons. Besides this, scholars often have to carry a heavy bundle of books to school, making the way still more burdensome.

During the afternoon's lessons which follow, both pupils and teachers struggle with the requirements of digestion. Now, I do not remember hearing such complaints uttered about afternoon lessons in countries where a good breakfast and only a small luncheon is the custom, and where dinner proper follows after the day's work. If I may argue from my personal experience as a man accustomed for many years to take a heavy breakfast, I think that one can work very well after such a meal in the early part of the day, for it would seem as if the organism is so much restored by sleep that brain and stomach can work at the same time without difficulty. The disadvantage of the arrangement described above goes so far that Schmid-Monnard found more sickly children in the lower schools in Halle, where afternoon lessons were the rule, than in other schools there, which had the same curriculum, but in which all lessons were given in the morning. This fact is to be explained also by the obvious reason that those pupils who have school in the afternoon cannot join as much in open air games as the others, because in the cities, during the short time remaining before the midday meal, no games can be organized. It is difficult to overcome these disadvantages, especially in high schools with their great number of lessons; the only way would be to shorten the lessons and the curriculum, so that a greater number of lessons could be gotten in before the dinner; but even now people do not everywhere realize that, in order to obtain something of real effect in matters of hygiene, concessions are often indispensable, and change in methods of instruction or similar means of reform alone cannot do everything.

Quite recently Burnham has dealt with the question of the daily sessions afresh, and quoted the American literature also.

Singular relations between body and mind may be found as a result of examinations of massed material, *e. g.*, in the final examinations in European high schools; a great deal of all that is taught during the 7, 8 or 9 years' course in the different kinds of high schools has then to be known all at once. It is a characteristic feature of those examinations that many years later they are the subject of nightmares. How intense these impressions must be to produce such results! It is only some years ago that I had the last of such dreams, I hope the very last, although it is nearly forty since I passed that final examination, and I feel sure that I am not at all an exceptional case. These dreams often worry people, although as far as memory work is concerned they have forgotten in the lapse of some months after the examination the greater part of all these details, so painfully accumulated for the purposes of examination. When a boy used to cram for such an examination, he not only spent whole days and the greater part of the nights for months in studying, but he was during the whole time in a state of tension, because he could not always test himself in all the memory work to see if he was sure of knowing it, and he was therefore kept in perpetual anxiety as to whether he was sufficiently well up in his subjects, to enable him to get through the examinations. By degrees the tremendous burden on the memory, entailed by such final examinations, is being somewhat diminished in Europe. Very interesting are the results obtained by the Russian Ignatieff, who examined the pupils in a military high school, where there are complicated examinations lasting for weeks, for the purpose of obtaining admission to certain special courses, which lead to a higher career. Notwithstanding a prolonged time for sleep and an improvement in diet, regular losses in weight were observed in the pupils, averaging about 4.5 lb. (over 2 kg.) during the course of the examination weeks.

After the examinations two months of fatiguing camp exercise followed, and then six weeks holidays; even after the holidays the pupils who had gone through the difficult examinations, had not regained their normal weight, even at the end of that period of rest.

The nervous tension, the excitement which accompanies the examination and impairs rest and sleep, influences the psychological sphere in such a manner that the physical development is damaged—possibly sometimes in an irreparable way.

Noteworthy also is the influence of psychical work as discovered by Key's investigations in the Swedish high schools. He stated from statistics that the actual amount of sleep becomes less with pupils of the same age in proportion as the standard is higher so that, *e. g.*, among the 15 years old pupils

52 per cent. of those who were in the third standard slept on an average $8\frac{1}{2}$ hours, but only 14 per cent. slept the same number of hours among those boys of 15 years who were in the fifth school year—the standard which the school organization has intended for pupils of that age. Loss of such an important factor in development as sleep is must if continually repeated have had consequences upon the young. How far schools sometimes are from understanding this fact is to be seen, *e. g.*, from the rules of one boarding school in Germany, a so-called “institute of education,” where the highest rate of sleep allowed is six hours. That is a relic of the middle ages.

Key has also incontestably proved in the Stockholm high schools that the percentage of sickly pupils is influenced by the greater or less amount of school work done at home. He reckoned out the average time spent on home work by all pupils, then divided the pupils into two classes, one of them containing the pupils who worked over, the other the pupils who worked under that average time; those working over the average time showed 5.3 per cent. more of ailing individuals than the others—and that in a country where in general the number of boys with impaired health has been found to be a high one. Similar results were obtained from analogous observations in a number of other small Swedish towns and in Copenhagen.

It is, however, to be presumed that in moderate climates the meteorological influences which are continually changing during the year are not without effect. I could prove from the Vienna children's hospital statistics that the curve of morbidity becomes higher from September until about the end of March, and goes down between April and September. It is also a matter of fact that augmentation of weight has its phases in the lapse of the solar year; it would not be surprising if such reasons did not affect the sum total of mental ability also. We all know the investigations of Porter of St. Louis on 33,500 boys and girls. He inquired “whether dullness and precocity are associated with a physical variation from the mean so palpable that it can be recognized by the coarse methods of investigation practicable in school work.” His figures show that pupils of a certain age are heavier and taller when found in the higher standards. I shall not go further into details, but every one who reads the results is inclined first of all to doubt their validity.

I was not able to make a similar investigation, but I have published in German a somewhat lengthy critical survey of the matter, and that induced Schmidt in Bonn to make a fresh investigation on 4,000 children, to confirm the results already

obtained. Further publications followed in Germany such as those of Graupner in Dresden, who obtained incidentally the same results from another independent investigation on about 57,000 children; Samosch in Breslau, published an investigation upon about 2,000 children; in Berlin 20,400 children were tested; Bayerthal made investigations on soldiers and school children; in Austria Quirsfeld in Rumburg; Igl in Bruenn, and Rosenfeld in Vienna made contribution in various ways. In Antwerp Schuyten made investigations with the dynamometer. In the United States Christopher and Smedley tested thousands of children with the ergograph and dynamometer; Carman found bright boys and girls in general physically stronger than dull ones. W. S. Cornell examined Pennsylvanian children in different ways, and I. E. Bryan tested 10,130 Camden children; from these investigations it is also to be seen that there is a connection between physical defect and backwardness in learning. Gilbert, however, studied Iowa and New Haven children, and Boas Toronto children; they did not, however, draw their conclusions from the advancement in standards, but from the teachers' impressions of quick intelligence in the children and could not prove a permanent relation between physical development and mental ability.

In England Clouston and Shuttleworth, in America Dawson and Tarbell, and in Germany Schmid-Monnard have made observations upon defective children in particular. It is a well-known fact that children who are mentally inferior are also less capable of resisting sickness, and that their death rate is higher than that of normal children.

It was intentionally that I quoted, although only in a cursory manner, this long series of investigations, because the sum total in almost every case shows similar results, namely that as a rule children with a higher physical endowment surpass in physical ability also, those endowed with lower physical gifts.

Naturally the physical status of the organs of the higher senses must have great influence upon mental development. Kerr in London studied about 1,400 boys and 1,400 girls, who were divided into two groups, precocious children, that is to say, those who were younger than the average age of their standard, and backward children. The backward ones show in every year of the ages which were examined for statistic purposes a higher percentage of children defective in vision than do the precocious ones.

Striking single cases are also known that illustrate the connection between physical and mental development; a Berlin school girl of 14 years of age, *e. g.*, was thought to be deaf; but after the adenoids from which she had been suffering had

been removed, the girl heard, but her mental development was only equal to that of a child two years old.

Gulick and Ayers found from their investigations in 15 schools of New York City that physical defects decrease with age; they say themselves "that the higher grades are to a certain extent made up of the survivors of the more fit," a fact which shows the great importance of the physical state upon mental development; but the authors find also that a consideration of probably "far greater weight is that children do actually outgrow their defects."

If we consider all these investigations and criticisms very carefully we may come to the conclusion that inferior physical gifts and development, as well as the existing of physical defects, will as a rule be followed by a lower physical condition, and therefore by small success in the school career, where so much depends on brain work—even if we are not far enough advanced to say with certainty how largely psychical inferiority is accounted for by physical inferiority, and how far ill success in education is everywhere due to this cause. But as a vigorous condition and development also influences future generations, it would be a matter to be regretted if the results of education itself as regards health were unfavorable to the higher development, since public education influences the people in every land more and more, and its results also in a physical direction must be of growing importance to every nation, and consequently to the whole human race—which is the greatest proof of the importance of school hygiene.

Our knowledge is added to like a mosaic piece by piece, and sometimes we imagine we have found the right piece to be put on a certain place of the mosaic, and alas! we find we are mistaken. Besides which, some results of investigation have a general significance, while others are influenced by local circumstances; we are far from seeing clearly in every direction, but so far as we can tell, mental work as one of the most complicated functions of the body, is not quite inaccessible to accurate investigation, and therefore we may expect further progress still in that direction, and we are entitled to suppose that the best methods of public education are of value to mankind in many different directions. But as exact knowledge only grows by degrees, then you must forgive me if what I have said in this lecture has been like the dissolving view of some disjointed pieces of that mosaic, to which we are each of us trying to add our share.

THE RESPONSIBILITIES OF THE TRAINING SCHOOL FOR TEACHERS IN MATTERS OF HYGIENE

By THOMAS A. STOREY, M. D., Ph. D.

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The training school for teachers has, I believe, three obligations to support in the matter of hygiene. First: It should make its environmental influence safe, sanitary, and hygienic. Second: It should turn out graduates whose physical influence is hygienic. Third: It should supply the school child, through its graduate teachers, with such information and experience as will lead him to become a factor in the solution of the health problems of humanity.

The first obligation is the obligation common to all institutions whose peculiar influences operate for any period of time upon the health of human beings. All such institutions are under a serious obligation to make those influences safe, sanitary and hygienic. The Training School for Teachers should support this obligation in the selection of its building site, architectural plans and material equipment; in the selection of its system of water supply, plumbing, heating, lighting, ventilation, sewerage and cleaning; in its provisions for the proper and adequate exercise of the fundamental health habits of the individuals under its institutional influences, through attractive and easy opportunities for physical exercise, recreation, rest, cleanliness (including bathing and care of the excretions), and for bodily nourishment. The Training School should further support this obligation through a careful exclusion from its student body of all individuals whose physical condition would be a menace to the health of their associates.

This first obligation is met by the employment of sanitary and hygienic experts for the selection of the building site, the architectural plans, the fixed and other material equipment, and for the supervision of certain phases of institutional administration; and by the employment of expert medical and hygienic service for the examination of candidates for matriculation, and for the inspection and examination of the student at appropriate intervals during his stay in the school.

This first obligation has to do primarily with the safety of the individual in the Training School. The second obligation which I wish to point out has to do primarily with the safety

of the school children with whom the Training School graduate may later come in contact. I believe that you will agree with me that the Training School for Teachers must employ every reasonable means to escape the graduation of teachers whose physical condition would be a menace to the health of their pupils. The exercise of this care is the second obligation which, I believe, the Training School for Teachers should support. The penalty for hygienic neglect in the Training School may be paid by the later sacrifice of the health or even the life of the school child.

This second obligation is partially met by those measures applied for the satisfaction of the first. If the first is adequately supported, the support of the second will be simplified. If the institutional influences are safe, sanitary, and hygienic and if the individual has brought no latent disease with him, his physical condition on graduation from the Training School will be good. He will at least be not likely to contract disease while under ideal institutional conditions. But it is one thing to be well and another thing to be healthy. I believe this obligation of the Training School for Teachers does not cease when all the external institutional influences have been made properly sanitary and hygienic. The teacher should not be merely well. He should be actively and aggressively healthy. His tissue cells should be ready to furnish on demand any of the protecting immunizing physiological products that defend the vigorous, healthy human being from disease. This protective resource resides in the tissue cells of the human body. Science teaches that this function is more efficient when the tissue cells are properly exercised, adequately rested, well nourished, and clean. We secure these influences on the tissue cell through the various proceedings that are included in physical education, or physical instruction, or physical training, or personal hygiene, or applied hygiene, or school hygiene, or whatever you choose to call the scheme of daily life which exercises the body, rests the body, secures its nourishment, and keeps it clean inside and out. I would then insist that the Training School for Teachers in order that it may graduate strong, vigorous and healthy teachers (this is my second obligation) should, in addition, give such instruction in the various subjects connected with the acquisition and conservation of health as will enable the prospective teacher to formulate *and apply* an intelligent policy of personal health control. Such a teacher is not likely to become a menace to the health of his pupils. Incidentally, he is more likely to become a success as a teacher.

The first obligation which I have cited is supported in the interest of the health of the individual for his own sake; the

second obligation is supported in the interest of the health of the individual for the sake of his future pupils. The third obligation which I wish to present is supported in the interest of the individual because of his probable influence upon his future pupils, and through them, on society.

I would state this obligation as follows:

The Training School for Teachers is under obligation to give such instruction as will enable its graduates to become successful teachers of hygiene.

In order to support this obligation adequately, the Training School must give its students instruction and practical work in general hygiene with special attention to those phases of hygiene that have to do with school and home life of the child. The teacher's equipment would then include a knowledge of the fundamental facts which form the scientific basis of hygiene, and it would also include ability to apply these facts to the life of the child in the recitation room, exercising hall, playground, study room, and other divisions of the school and home. This would include the instruction we now give under such names as General or Elementary Hygiene, School Hygiene, Personal Hygiene, and Physical Education.

I insist upon the importance of this obligation of the Training School to prepare teachers of hygiene for various reasons. The world's wisest and greatest educators, have agreed, so far as I have been able to discover, that the sound, healthy body is of first importance in the education of the human being. The academic objects of the school curriculum are more satisfactorily realized if the pupils are healthy. If, then, the Training School gives its graduates successful instruction concerning the facts that regulate human health, it is supplying those graduates with a means for securing better scholastic work from their pupils.

In addition, it is our business to turn out efficient grammar school, or high school, or college, or university graduates. The graduate without health is a graduate with a limited efficiency. The healthy grammar school, high school, college, or university graduate is worth more to himself, worth more to his community, and worth more to his country because of his health. The baker, the butcher, the motor man, the business man, the farmer, the banker, the lawyer, the physician, the teacher—every man in every activity of life draws his vitality, his vigor and his endurance from his store of health; and upon his good health he builds his domestic, business, professional, religious, or academic success.

And again, the Training School for Teachers is under obligation to produce graduates equipped to teach hygiene successfully because of the unique opportunities the Training School

has for educating the masses. Every teaching graduate of the Training School becomes a radiating point from which the educational influences of the Training School emanate in every direction. In his contact with, and influence on, parents and children, the teacher secures an opportunity which is found nowhere else in human affairs. This opportunity should be used in the interest of the common weal.

Disease is the penalty we pay for hygienic ignorance. We are ignorant nowadays because we are not taught. There is knowledge enough but it has not reached the masses. Every school child should know the simple ways and means of securing and conserving health; he should know the detrimental health influences of abnormal conditions and habits. Every school child should be forming proper health habits. Every school child should spend his school life under proper conditions of school hygiene. Every school child should learn before he leaves the school the main facts concerned with the causes of disease, the carriers of disease, our defences against disease, and the nature of our common diseases.

If the hundreds of thousands of young men and women who graduate from our grammar schools and high schools each year could carry with them an accurate knowledge of these subjects we would, in a few years have no native born parent ignorant of the fundamental facts of hygiene. The difficulties that now oppose the progress of hygiene in the school, in the home, and in the city and state would largely disappear. We would ultimately become a stronger, more vigorous, and more efficient race, better able to realize the higher ideals that make human life worth the living.

THE INSTRUCTION OF TEACHERS IN SCHOOL HYGIENE

By GUY MONTROSE WHIPPLE, Ph. D., Cornell University

It is unnecessary for me on this occasion to dwell long upon the importance of instruction in hygiene. I hold it to be self-evident that every teacher and every child in our schools has the right to health, that when the state makes schooling compulsory, it thereby engages itself to provide that schooling under sanitary and healthful conditions. I hold it to be equally self-evident that no teacher can render to the community and to the pupils in his charge the best service of which he is capable, if he is ignorant of his own rights to health and careless of those of his pupils. On this account alone, instruction in the hygiene of the school environment is an essential part of the teacher's preparation.

Again, we live at a time when the problems of health are more and more engaging public attention. The fight against tuberculosis, the crusade for clean milk, the playground movement, the introduction of medical inspection, pure food legislation, agitation for the enforcement of tenement-house laws, the popularization of medical knowledge in magazine literature,—these are but a few of the activities that betoken present-day progress toward better personal and civic health. Teachers, then, need instruction, not only in those special phases of hygiene that relate to the school environment, but also, to the end that they may teach health more intelligently and preach health more enthusiastically, in the general principles of public health and sanitation.¹

¹ At the Second International Congress on School Hygiene, at London, 1907, this resolution was adopted:

Whereas the improvement in the health of, and the hygienic conditions surrounding, school children depends largely upon the intelligent co-operation, the competency, the interest and the faithfulness of teachers and principals in matters of hygienic importance, therefore be it *Resolved*:

That all schools having courses for the training of teachers should give instruction in (a) personal and school hygiene, and (b) the principles and practice of physical training. And that to each of these subjects should be given as much time as to the major subjects in the course.

That practical and theoretical instruction in personal and school hygiene should form a regular part of the curriculum of all institutions in which students are trained to become teachers in schools of all grades.

Granted, then, that instruction in school hygiene should be a fundamental feature of the training of teachers, a number of questions arise. Are such courses commonly given to teachers at present? How can the introduction of such courses be encouraged or assured? How can teachers in the field be instructed? What should be the length of the course? What should be the nature and content of the course? These questions I shall seek to answer so far as my time will permit.

(1). *Are courses in school hygiene commonly given to teachers in training at the present time?* I believe that I am correct when I say that instruction in school hygiene is not a regular, nor even a common, feature of the training of teachers in the United States.

I base this conclusion in part upon personal contact with teachers. So often have I been amazed at the lack of knowledge of the most elementary principles of school hygiene that well-intentioned superintendents and teachers may exhibit. Teachers in training may be excusable when they ask: "Why should I take a course in school hygiene? It's just something about measuring desks, isn't it?" But those who have been responsible for their training should be ashamed to have teachers in the field ask, as I have heard them ask: "Why should I need to know anything about medical inspection?" or "When shall we hear the end of this eye-glasses fad?" or "What's this silly fuss about adenoids?" or, as in one instance reported to me: "Why should I keep Johnny Smith out of school? I don't believe that scarlet fever is catching, anyway."

I base my conclusion, also, upon a somewhat hurried survey of the catalogues and courses of study in some 35 normal schools and college departments of education. I am informed that the Bureau of Education is now collecting statistics of the number of institutions that offer courses in school hygiene; until these figures are published, one must avoid more positive generalization. It is, however, safe to say that we are outranked by European practice in this particular. In Scotland, for example, the joint committee of university training centres provides that "the course of professional training shall include attendance at an approved course in personal and school hygiene, to extend over a period of two terms of at least ten weeks each, and to include 30 to 50 hours' instruction." This instruction, it is explained, includes not only lectures, but also visits to schools and study of their equipment from a hygienic point of view, together with practice in the physical observation of children and in the conduct of tests of sight and hearing.

(2). *How can the introduction of courses in school hygiene into the curriculum of professional training schools be encouraged and assured?* To this query I can only make a few suggestive proposals. I propose (a) that the heads of departments of education in our colleges and the principals of our normal schools collaborate in devising ways and means of introducing such a course, (b) that the need of the course be presented in educational journals, before teachers' institutes and state teachers' associations, (c) that the need of the course be brought as forcibly and as clearly as possible to the attention

of state superintendents of public instruction,¹ (*d*) that the American School Hygiene Association lend its aid to the movement, and (*e*) that the Bureau of Education at Washington lend the weight of its authoritative support by publishing appropriate bulletins and by otherwise promoting the introduction of this work.

(3). *How can school hygiene be taught to teachers in the field?* This question possesses perhaps even greater importance than the preceding one, since the number of teachers in the field is greater than the number in training, and since they can be less easily reached or affected by the adoption of new regulations on the part of the governing boards that control our training schools. A possible solution of the question has come to me recently through conversations with a number of school superintendents. I find that many superintendents, who are firmly convinced of the need of holding periodic teachers' meetings, are at a loss to know what is best to do with these meetings when they are held. Why, now, should not these superintendents take up the study of school hygiene with their teachers? The subject seems to me well-nigh ideal for this purpose; for, as we have seen, many teachers sadly need this knowledge; it has unquestionably a direct and immediate bearing upon their work; it concerns teachers of all grades from the kindergarten to the high school; and it offers unlimited scope for study, though returning value from even a limited expenditure of time and effort.

More specifically, I suggest that the school or public library be equipped with the best texts in school and personal hygiene, and that the superintendent assign topics for discussion at each meeting. These meetings may be devoted to formal papers by different teachers, to lectures by physicians, health officers, eye and ear specialists, university or state-department authorities, or to informal discussions led by the superintendent or his principals.²

¹The aim should be, of course, to obtain official recognition of school hygiene as an integral part of the required course of training in all the normal schools, training classes, and schools of education that are under state supervision or control. In New York State, to illustrate present conditions, the Department of Education at Albany issues a syllabus which prescribes in some detail the professional courses (history of education, psychology, etc.) that must be taken in the universities, or passed in state examinations, before certain certificates are granted to college graduates. Since school hygiene is not specifically mentioned in this syllabus, the subject, when given at all, is, perforce, given as an elective course only.

²The possibilities of this plan have so appealed to me that I have prepared a small guide book (*Questions In School Hygiene*, published by C. W. Bardeen, Syracuse) with special thought of its use by bodies of teachers in the field, as well as by classes in institutional courses.

(4). *How much time may, or should, be spent by teachers upon the study of school hygiene?* For teachers in training, a course of 30 hours (classroom meetings) is to be regarded as a minimal expenditure of time. If the students have a fair knowledge of physiology, and preferably, too, of psychology, this time is, I think, adequate for the assimilation of the general principles underlying the subject. Because, however, of the fact that school hygiene is peculiarly a subject that exacts specific knowledge of a large number of details, it is possible for advanced students or graduate students to carry their study much farther with corresponding advantage, especially if drill or research 'practicums' can be arranged.

(5). *What should be the content of the course in school hygiene?* Without wishing to put stress upon the order of presentation, I would include in a course on school hygiene at least the following main topics, or groups of topics: (*a*) the schoolhouse site and grounds, (*b*) general principles of schoolhouse construction, (*c*) the form and size of the classroom, (*d*) the illumination of the classroom, (*e*) school furniture, with special reference to desks and chairs, (*f*) heating and ventilating, (*g*) sanitation (in the narrower sense), (*h*) the hygiene of vision, (*i*) the hygiene of reading, (*j*) the hygiene of writing, (*k*) the hygiene of the ear, (*l*) the hygiene of the mouth, throat and nose, (*m*) school diseases and accidents, (*n*) medical inspection, and (*o*) miscellaneous topics, such as growth, instruction in sex hygiene, fatigue, overpressure, rest-pauses and the school programme, sleep, exercise, diet, and clothing.

Allow me, if you will, to add some words of comment and explanation.

Teachers not infrequently express the feeling that the study of schoolhouse construction (site, illumination, heating and ventilating, etc.,) is unnecessary for them, since they can have no direct share in the erection, or even in the equipment of the building. This view is surely unwarranted; the teacher should look upon the school building and its grounds as his immediate

As the title implies, this book takes the form of a series of questions; these questions are grouped under appropriate classificatory heads and prefaced by page or chapter references to a number of standard books. With the questions before them, the teachers are not confined to any single text-book, but can draw upon numerous sources for their information, especially by following the suggestions for supplementary reading that have been embodied in the guide. This method, I am confident, will enable superintendents and teachers to undertake the study and application of school hygiene with profit and advantage both to themselves and to the children in their charge. Lectures by local talent could be secured in almost any community, and it might not be impossible to enlist the interest of mothers' clubs, child-study clubs, and similar organizations, whose purpose coincides, in part at least, with that of the organization of teachers.

professional environment, and he should know how to make the most effective use of this environment, whether good or bad; he should also have clearly in his mind the possibilities of ideal schoolhouse construction, so that he may understand in what ways his own building might be improved, so that, if, as not infrequently happens, extensive alterations are made in old buildings or new buildings are erected, he may be able to make helpful suggestions, and to request, if not to demand, those things that he knows are possible and desirable.

So far, too, as illumination, heating, and ventilation are concerned, these are matters that continually demand technical knowledge of the teacher.¹ I would, accordingly, give careful attention to these phases of the course in school hygiene; I would ensure real comprehension of sanitary building construction by the use of abundant photographs, charts, and other illustrative material, and by directing members of the class to visit and report upon the construction and equipment of school buildings in actual use.

Much the same comment may be made with regard to the study of school furniture. I cannot accept the statements made by some persons that "there is nothing in the school desk problem." Here, again, a study of the actual seating of children, supplemented by the exhibition of photographs, models, and samples of various desks, with practice in adjusting desks and chairs to pupils, will show the reality of the seating problem. Special attention should also be paid to the teaching of corrective exercises, *i. e.*, exercises on the order of the 'setting-up' drill that will counteract the evils of bad desk habits.

Under sanitation I would include a study of the general principles underlying the operation of different systems of sewage disposal, of the problem of pure drinking water, of the need of school lavatories and baths, and especially of the best methods of mitigating the dust nuisance, with reference also to the rules that should govern the work of janitors in sweeping, dusting and cleaning the school building.

The study of the hygiene of reading and of writing should be approached from the study of the hygiene of the eye. Students should, therefore, first be made thoroughly familiar with the mechanism of accommodation, and should understand

¹ Thus, for instance, in the course of a thorough study of the sanitary condition of a certain grammar-school building, I found that, although the building was an old one and confessedly poorly built and equipped, it was plain that the teachers were not getting the best use of the heating system that was installed, and that they were neglecting to adjust the window shades or seat the pupils so as to utilize the light that was available.

the genesis and the methods of testing and of correcting (in so far as this is possible) such defects as myopia, hyperopia, astigmatism, color-blindness, and the grosser forms of ocular imbalance.

The hygiene of writing should reveal the far-reaching importance of the writing posture, and this should lead to an understanding of the relation of different systems of writing to bodily posture, and of the duties and responsibilities of the teacher in overseeing and developing proper habits of posture.

In the study of the ear, as in that of the eye, it is imperative to make clear the operation of the organ itself, to convince teachers of the intimate relation between sensory defect and school efficiency, and to practice them in conducting sensory tests in an accurate manner. The limitations and sources of error that inhere in these tests must not be disregarded.

Similarly, general knowledge of the anatomy and physiology of the mouth, nose, and throat is a prerequisite to the study of the hygiene of these important structures. Models, diagrams, and even dissected specimens, should be brought into the classroom, and practice should be given in the inspection of the buccal and nasal passages in children. Needless to add that special emphasis must be laid upon the serious and far-reaching consequences of adenoids and defective teeth.

School teachers cannot be expected to have a thorough technical knowledge of the so-called 'school diseases,' but they can be expected to be thoroughly familiar with their symptoms, and, in a general way, at least, with their causes and consequences. More particularly, they should know what preventive measures may, and must be, taken to avoid the outbreak of epidemics and the spread of infectious diseases. This knowledge may profitably be summarized by each student for himself in the form of a table that shall indicate (*a*) the cause, (*b*) the symptoms, (*c*) the period of invasion, (*d*) the period of incubation, (*e*) the period of infection, (*f*) the length of quarantine, (*g*) the complications to be feared, and (*h*) the teacher's duties, with respect to diphtheria, whooping cough, measles, scarlet fever, chicken-pox, smallpox and mumps. All teachers should be in a position to give instruction in the origin, symptoms, prevalence, outcome, and treatment of tuberculosis, and should understand clearly the nature and importance of bodily resistance to infection from it and from other infectious diseases.

Of the non-contagious diseases and defective conditions, I would require general knowledge of scoliosis, chorea, epilepsy, and feeble-mindedness.

Ability to handle the more ordinary types of school accidents, such as nose-bleeding, burns, sprains, fainting, and even the more serious accidents, such as bleeding from cut arteries and

veins, broken limbs and drowning, may be acquired without much difficulty, so far as verbal instruction can avail

The course in school hygiene cannot neglect the discussion of medical inspection, since teachers must be led both to encourage the adoption of the system in their own schools and to co-operate intelligently with nurses and physicians, when it has been introduced.

There remains, finally, a group of topics that I have referred to as miscellaneous topics; but they are not on this account of little importance. I have in mind the hygiene of growth, rest, sleep, fatigue, exercise, instruction in sex hygiene, and questions relating to diet and clothing.

The study of normal growth leads naturally to a discussion of physical, and hence of mental, retardation, with reference to its causes and treatment, and to its effect upon school work and progress.

Although we are far from full scientific knowledge of the complex condition termed fatigue, we can, nevertheless, familiarize teachers with its more patent symptoms, and can discuss with profit the optimal adjustment of the school programme (order of exercises, time of taking up different subjects, number, length, and nature of recesses, and other rest-pauses).

I deem it self-evident that every teacher of school hygiene must give his students a frank and objective talk upon the sex-hygiene problem, and that he must encourage them to work out the solution of instruction in sex hygiene with perseverance and tact.

The programme that I have sketched, ladies and gentlemen, is doubtless incomplete, and it is certainly open to revision. The detailed elaboration of any course of study requires more time and experience than has yet been our lot in the teaching of school hygiene. But that the general principle upon which this programme is based,—the necessity for accurate knowledge on the part of every teacher of the fundamental facts of school hygiene,—is correct, I have no doubt.

The teacher holds a strategic position; he controls in large measure the environment and the formation of habits and ideals of the coming generation. With the teacher, therefore, rests the possibility and the hope for progress in health and for the attainment of that happiness which good health alone assures.

RESEARCH IN SCHOOL HYGIENE, IN THE LIGHT
OF EXPERIENCES IN AN INSTITUTION FOR
THE FEEBLE MINDED. ABSTRACT

HENRY H. GODDARD Ph. D., Vineland, N. J.

It may be a surprise to some that this subject is to be discussed by one who is working with imbeciles and idiots. But I can assure you that in one institution at least there is a most unique opportunity to make researches in School Hygiene as well as in many other lines.

Some four years ago a great man conceived a great idea. The superintendent of an institution for the feeble minded had for some time been asking himself what justification could society find for the large sums of money it was expending on its defectives.

His conclusion was that there was no justification for more than a reasonably comfortable living unless society received some return. What return can it receive? The greatest in the world! Here are hundreds of unfortunate beings whose condition cries out to be investigated. We have these children under ideal conditions for studying them and their problems.

An institution for defectives should be a laboratory for scientific research into the condition and causes of the thing which has made the institution necessary.

That is the great idea! Supt. Johnstone is a man to whom the thing that ought to be is the thing that must be. Therefore when he had evolved that idea he said to a group of thoughtful men who had assembled to discuss some of the larger problems in an informal way, "Gentlemen, I have the money to run a department of Research for a year. Tell me where I can get a man."

It would have been impossible to have found either cash, collateral or promises to back up that statement. Nevertheless it was a true statement, when one understands just what sort of commodity it is that makes possible the greatest human achievements. It is faith. Superintendent Johnstone is a practical optimist. He is like Francke, who founded the Institutions of Halle on a few florins and an abundance of faith. Only Johnstone did not have even the few florins. He had the conviction that the thing ought to be done—and he did it. The money came. Enough for that year; enough for the second

year and enough for the third year. And it will come for all the rest.

Here is the opportunity: nearly four hundred feeble minded boys and girls (many of them men and women in years) to whom nothing but good and happiness can come from a scientific study of their cases. Here is a superintendent and Board of Directors who are so wise that they believe that everything should be done to facilitate such research work.

Under these circumstances we have laid out a rather comprehensive plan which I cannot now detail to you.

You will now understand that in connection with the carrying out of this plan I have collected the data which constitute what little contribution I may be able to make to this discussion.

One of the first things we did was to try to determine the growth curve for mental defectives. We have the measurements of some eight thousand children. We have divided this according to the grade of the child into high grade or nearest normal, middle grade (imbecile) and low grade (idiot) and plotted the growth curve for each group. This is the result:

The idiots are farthest below normal in both height and weight, and at the age of nine years they begin a still greater deviation from normal, and as the years go by fall steadily more and more.

The imbeciles are a little below normal all the time and at the age of fourteen begin their increasing deviation or drop from the normal curve.

Lastly the high grade curve is practically coincident with the normal up to the age of nineteen, when the feeble minded boy stops growing while the normal boy goes on until 23 years of age.

This is for boys. The girls' curves show the same thing to a certain extent, but the course of the curve is interfered with by another factor.

Recall, if you please, the pubertal acceleration where the girls' curve crosses the boys. If now you imagine the curve of our feeble minded girls drawn in you would see it taking its up-shoot a little later than with the normal but going much higher, so that we have the surprising phenomenon of feeble minded girls growing much faster and being heavier and taller from thirteen to fifteen years of age than the normal girls.

If now we seek for conditions to explain this we are met with the following considerations:

The feeble minded girls in institutions, upon whose measurements these curves are based, live according to hygienic prin-

ciples. They eat plain, wholesome food at regular times and in proper quantities. They have abundance of sleep also at regular hours. They have much play and exercise in the open air. They have nothing to worry them. Their heredity is poor.

The normal girls are quite different. It must be remembered that all our statistics are based on school girls and that the girls who are still in school from 13 to 15 are of the better class socially. Many of them are in the high school, many of the rest are preparing for it. They are not generally living under hygienic conditions. They are beginning to enter into social life; are often out rather late at night at parties, etc., thereby interfering with regular sleep and not infrequently getting too little sleep. They are eating, as a rule, more fancy food, much candy, and on the whole a far from satisfactory diet. Add to this the weight of their school work with its worry and anxiety, and we have a picture the very opposite of the other one. And these children have good heredity.

Now in view of these facts, it would seem as though the feeble minded group, living under good hygienic conditions, was more likely to give us a normal curve. In this event we should have to conclude that the usual pubertal acceleration is not as great as it ought to be, but is actually retarded by the relatively unhygienic lives of our girls at this period.

If the interpretation be correct, it surely points to a radical change in our treatment of the adolescent girl both in school and at home.

OPPORTUNITY AND NEED FOR RESEARCH WORK IN THE HISTORY OF EDUCATION

By PAUL MONROE, PH. D., Teachers College, Columbia University

As educators we are concerned with two factors which effect the advance in our educational activities; one is the improvement of practice; the other, the increase of knowledge which furnishes the basis for that improvement in practice.

It is unnecessary to argue that there can be no improvement in practice without such an increase in knowledge; and unnecessary, in a body of scientific students, to urge that any increase in knowledge, no matter how remote and recondite, has an ultimate bearing of a practical character in that it will affect conduct or practice when such knowledge is given its proper setting.

It is to be regretfully admitted, however, that the same cannot be said of all university groups, so far as our own subject is concerned. For we have to confess to a very general skepticism on the part of university faculties and of the departments of long standing, concerning the possibility of the scientific study of educational activities, either of exact, comparative or historical character, and a disinclination to any obligation on the part of the university towards educational practice outside of university instruction itself. No doubt both this skepticism and disinclination to admit obligation are due to the non-scientific character of prevailing educational practices and to the paucity of results of such scientific studies as have been made: hence, both the need and the opportunity for such work as our topic indicates.

Increase of knowledge is to be effected in two respects: (1) in the higher level of intelligence on the part of the rank and file of the practitioners of our profession. This in reality concerns the professional training of teachers, or rather *is* the professional training of teachers. The dissemination of knowledge concerning our professional activities is a function of our universities and colleges as well as of normal and training schools, possibly also of our secondary schools. That this should be so has been the argument of enlightened educators, in the English speaking race, from the time of Mulcaster, Brinsley, and Francis Bacon. Bacon termed the educational process "tradition";—that process by which one generation

hands down to the succeeding one, those practices, customs, ideals, achievements which it considers to be of value ;—and argued that the study of tradition should find a place in every university. But because education *is* tradition, it tends to be hampered by the inertia of social institutions beyond most other aspects of social life that have come under the ægis of special professional classes.

So we have awaited our own day to find a tardy, reluctant and partial recognition of the obligation of the university to society in respect to this phase of institutional activity which is most essential to present social welfare and to social progress.

But this aspect of our subject is to have special consideration in to-morrow's conference.

That phase of our topic which we have for special consideration to-day relates to the second aspect of the increase of professional knowledge : namely, the actual enlargement of the bounds of knowledge concerning that phase of social activity which we term education. There will be little or no aversion on the part of university authorities or of university men, in whatever line they may be, to the incorporation of such study within the range of university work, so long as the need and opportunity for such can be indicated and some actual achievements demonstrated.

Scientific investigation of the phenomena of education falls into a variety of fields ; that using symbolical or logical methods, that using experimental methods and that using comparative methods,—the three great scientific methods. The logical or symbolical method has long been used ; and the development of the philosophical treatment of education,—the formulation of the theory of education,—has received the attention of acute minds on many occasions for many centuries. The chief contribution of the German students during the 18th and 19th centuries were along these lines. And there promises even now a revival of interest along this line, stimulated no doubt by the progress in allied lines by the use of the experimental and comparative methods based upon the progress of physical, biological and sociological sciences. The progress of the 19th century in the field of educational thought and practice was chiefly due to the use of the experimental methods, essentially in the field of psychology.

The application of comparative methods to educational data, as in the field of historical and sociological phenomena, is the most recent development. It must be confessed that little progress has been made as yet. One phase of this new development of scientific study of education by comparative methods, namely, that in the field of historical data, is the special subject of my brief discussion.

Naturally the development of such study in the educational field follows a long way after its development in other aspects of historical phenomena. But as the centre of interest has shifted from the old political, military and dynastic aspects of social life, or at least the interest has broadened to take in other phases of life no less important, though somewhat less definite and tangible, this development has gone on apace.

For the most part such work as has been done of critical value, of any great importance, has been conducted as a phase of the study of culture, with no special interest in education as a formal process. It is the university as an institution, or the development of some special field of knowledge as a part of the general growth in intelligence, that has been studied; not the actual formal process of the transfer of knowledge from one generation to another, or the dissemination of information and technical ability, or the effort to secure social progress through attractive rather than compulsory force. Now, however, there seems to be developing some genuine interest in the scientific investigation of historical phenomena, that may be classified as educational in the more restricted sense.

Our main interest is in the opportunity and need for such work. Both the opportunity and need can be made somewhat clearer by a brief consideration of what has been done.

The summary is very brief so far as English and American contributions are concerned. The history of universities has always commanded the interest of a few of their sons and such records have been more or less critically examined by students. But it has awaited the work of Mullinger, now a generation ago, or more especially that of Rashdall, for any genuine scientific investigation. Recently, however, we are reaping the fruits of the establishment of chairs in education in universities of Great Britain, in the work of Woodward, Watson, Adamson, Montmorency, Leach, and others. We have no work to compare with this in America.

Outside of a few theses, still fewer monographs, chief among which is the notable contribution of the chairman of this conference (Commissioner Brown), there have been practically no American contributions. The ordinary histories which give a survey of the entire educational development or of the development of any particular type of institution, suffer on almost every page from that bane of uncritical work, namely, the acceptance of anything which appears on the printed page or in a written document as an established fact.

The same criticism cannot be passed upon the German work in this field. As is to be expected German scholarship has long cultivated this field. In a peculiar sense, the history of education, as an organized body of knowledge, is a product of

German research. From the time of the earlier students of the subject, in the middle of the 18th century, down to the present the interest and productivity has been continuous. The earlier works were of two types, either a history of educational institutions or of leading educators of particular countries, or the application of some system of philosophy to pedagogical doctrine, as in the case of Rosenkranz.

The later systematic works suffered in a way from a bias of the author—this cannot be eliminated. The first great systematic treatise, that of von Raumer in the early 40's—suffered throughout from the bias of an extreme classicist in dealing with realistic and all more democratic social movements. If the university presentation of the subject suffered from the bias of the classicists, the ordinary organization for purposes of instruction in the state supported schools for the training of teachers, suffered from the bias arising from an official religion and from a system of theology to be defended and inculcated. But the more recent work, such as Specht of a generation ago, or of Heubaum, or even Sherer of recent appearance, are beyond such reproaches. Such monographs as the series edited by Steinhausen (*Monographien zur deutschen Kulturgeschichte*), stand as a monument and as a model of combination, scholarly worth, and of popular presentation.

The opportunity and need for research work in the history of education, I will consider briefly in regard to the American field.

As to opportunity in our own educational history may it be noted, in the first place, that in the case of the American colonists we have the first instance of the founding of a civilization or culture or society, in which the founders kept a complete record of their motives and actions. These records are for the most part extant and include the materials for an educational history. These founders of the new society were self conscious to a high degree, examined their motives and were conscientious in recording their actions since they considered themselves to be a chosen people, with divine injunction resting upon them. Even in the case of the commercial colonies, the religious interest was so great as to demand some attention to the training of children in a formal manner.

Second: Note that these records are available. Not only the transactions of the general executive and legislative bodies are preserved in detail, but the local records are also fairly well preserved and are accessible. The New England town records are well preserved. In the case of 30 or more of these towns they are available in printed form. These contain most minute records of educational activities. In some of the larger towns the records of the school committee are also available.

In the case of New York the records of the Dutch West India Company were unfortunately destroyed, as late as the 19th century, but there are many other local records preserved. The parish records of Virginia and other southern colonies are many of them in existence. The examination of these for materials relating to educational activities is bound to throw new light on the life and ideals of these colonists and compel us to reverse our notion of their educational activities and interests. The records of the Society for the Propagation of the Gospel in Foreign Parts, which cared for the elementary education in all the royal colonies are extant practically complete.

The general records of the colonies are available and the educational material has been made fairly accessible. For the early 19th century there is a mass of material all unassorted, unanalyzed and undigested. There is no lack of opportunity.

A third point in regard to the opportunity is to be noted. The students of the early history of our country tell us that the most interesting of all points is to establish the actual transfer of institutions from Europe to this country; that this can be done very rarely. Here lies a very great opportunity for students of education, for it can be done regarding the school and educational practices. Despite the fact that the controversialists argue that there were no publicly supported schools in England, and no system of elementary schools as convincing proof that the colonists got their idea of schools from Holland or Scotland, it can be demonstrated that elementary education even in New England was a direct transfer from England. For the early schools laws in all our colonies were but modifications of the poor laws and the laws governing apprenticeship in England, and the early schools were fit instruments for carrying these out.

A fourth point to be noted in connection with the opportunity, is that the educational activity is about the only phase of the life of our people, especially in the colonial period, that has not been critically examined.

Colonial politics, colonial government, colonial religion, colonial customs, colonial dress, colonial literature, colonial industries, colonial theology, colonial philosophy have all been investigated, but colonial educational institutions, practices, ideals, methods, customs, have hardly been touched so far as the first hand information is concerned. And yet no phase of life is more thoroughly controlled by tradition than is education, and hence more worthy of study. The 19th century received its educational inheritance direct; and few fields of research are more fertile, and promise a more practical and serviceable harvest than that in education. The district system, the free

school, the academy, the non-sectarian college, the state university, all took their origin from conditions in the 18th century. They are the essentials of our educational system to-day.

The Need. The opportunity is great: the need is no less. So many reasons for such study suggest themselves that it is possible in the brief time at our disposal to suggest only a few type arguments.

And, first, one phase in the general need: such a study would assist in removing a great number of errors in our accepted educational traditions. Such for example as the conclusion that there were no schools and no interest in education in Virginia drawn from Gov. Berkeley's oft quoted report to the English government to the effect that he "thanked God that there were no free schools or printing presses and hoped that there would not be for a century." The most significant portion of the testy old governor's report is the sentence preceding, which is always omitted, namely, regarding education there prevails "the same course that is taken in England out of towns: every man according to his ability instructing his children."

Or more interesting yet, as indicating how a historical myth can grow up, take the case of the first New York school, long proclaimed as the first school in America. This myth all grew out of an inference which O'Callaghan, the first official historian of New York, made in his compilation of the early lists of settlers. From the examination of various legal and other historical documents, Mr. O'Callaghan drew up a list of the officers and servants of the company, among which was found that of Adam Rolandson, the first schoolmaster. Or to be exact, O'Callaghan's statement is, after giving the list of officers in the service of the company: "At Fort Amsterdam, at which place the Rev. Everardus Bogardus officiated as minister of the gospel." . . . "Adam Rolandson, 'schoolmaster,' arrived about the same time." Broadhead followed O'Callaghan with his history of New York and referring to the year 1638 makes the statement that "Rev. Bogardus continued to officiate as clergyman at Fort Amsterdam where Adam Rolandson was schoolmaster." Mr. Dunshee writing on the history of the Dutch Reform School in New York shortly after this puts the inferences of O'Callaghan and the statement of Broadhead together, interpolates a few words of his own, and makes Rolandson, who evidently was present in New Amsterdam in 1633 and who in 1638 does sign himself schoolmaster, as schoolmaster from the first. So that the history of the case then reads as follows: "In an extended list of the officers and servants of the Dutch West India Company

in 1638 Rev. Everardus Bogardus is again mentioned as minister at Fort Amsterdam where Adam Rolandson was still the schoolmaster." (Since 1633.) This statement has been repeated by all subsequent histories of education. As a matter of fact, the only evidence upon this educational history was all based upon a single affidavit made by Rolandson in 1638, to the effect that in 1633, while standing at the landing place in New Amsterdam, he witnessed some scandalous conduct on the part of one of the settlers. This affidavit was made to impeach the character of the witness testifying slanderously as to the character of the pastor. In the ecclesiastical records published in 1901, some further documents bearing upon this matter are brought to light, one to the effect that the same Rolandson applied for a license to teach and was examined by the Classis at Amsterdam according to the statute passed in 1636. This license was granted on the 4th of August, 1637, with the statement that he had requested the license in order to go to New Netherlands as schoolmaster and was accepted, the record closing with the statement "and he was sent thither." There he is again found in 1638, where he probably could not have arrived before the fall of that year, as we know from the records of the ship's arriving. So that the whole story of the much heralded first school in America falls to pieces after a little examination of the record and the long debate as to the priority of educational institutions in this country, upon which has been built a great structure of educational history, is found to have been erected on a single document of a scurrilous character, having absolutely no reference to education and resulting in the wholly erroneous use of a harmless inference of an early historical investigator. Our history of education is full of such unsubstantiated inferences.

Second, we should note the need to the teaching profession itself. Here the value of historical study is the guidance it will give in testing the great variety of ideas and methods brought forth each year by educational experimenters or novices. For the most part these so-called *new* methods or ideas are not new; most of them have been suggested time and time again; most of them have been tried, most of them have failed, or proven but partially successful. To this class belong the great number of so-called "fads and frills." No profession is so dependent upon tradition as is that of the teacher. In attempting to throw off the thralldom of tradition the innovator is apt to go to the other extreme and develop a fad or append a frill. Now an educational fad is simply a worthy educational idea or practice out of focus,—exaggerated. An educated frill is a desirable supplement to existing educational endeavor but not organically related. Historical research will reveal

such endeavor as made in the past, and by presenting all the conditions of the experiment, will enable it to be judged on its merits and in its relations. All of our educational mistakes have been repeated over and over. Most of the worthy modifications have been attempted time and time again before they are properly accepted and incorporated into the dominant body of practices. Historical study will develop a saner judgment to pass upon all individual suggestion claiming the merit of novelty; a keener insight to consider an experiment or an accepted practice in all its relationships; an open-mindedness toward suggestion of improvement and a keener desire to bring that which is to what it might be.

Third there are the needs which suggest themselves when education is considered from the standpoint of university studies or disciplines. By the use of historical and of experimental scientific methods we can bring our work into harmony with other university studies. When the professional student of education can demonstrate that he uses the same scientific methods, has ideals and aims of pure scholarship as well as those of practical accomplishment, works upon similar materials, the prejudices which arise in academic circles towards any new and partially formulated subject will disappear, so far as his own subject is concerned. Each new field of human interest as it has passed through the field of partial organization has met this criticism and opposition of the devotees of better organized intellectual interests. The natural sciences themselves had a longer and more bitter struggle than any other; hence it is to be expected that they would repeat the opposition to the newer social science, which from the very nature of the phenomena dealt with can never possess the same definite organization. But the scientific study of education has won a place in all higher institutions of learning, has won the respect of the modern university man, because of its practical necessity and real influence; perhaps, as yet, it is too much to ask for intellectual sympathy from the devotees of these disciplines where the "pure" is yet sharply distinguished from the "applied."

Finally there is the need of the student. There are some decided advantages to be derived from the use of the exact scientific methods of study of educational phenomena which do not inhere in the use of the comparative historical method. On the other hand this latter method possesses distinctive merits of its own; and these merits commend it especially to the student of education. The experimental method depends for its success always upon the elimination of many factors which actually exist in the problem; to such an extent is this true that the problem worked with and solved is usually a highly

artificial one, isolated from real life by successive elimination of factors which do not enter into the particular problem attacked, but do enter into life wherever the problem occurs. Now the historical problem is always the solution of organic relationships by means of comparative methods. The student must always deal with the problem as it actually occurs in life, and reaches his conclusions by comparisons with similar problems of actual life or of the same problem under somewhat different social conditions. In other words such study tends not only to produce those results which inhere in all scientific training, but also to develop those very qualities that are most used by the successful teacher.

He develops not only keen insight and good judgment but also the intellectual sympathy which produces that breadth of interest, that "many sided interest," which is the test of the well developed personality of the adult as well as the ideal and objective of schoolroom instruction.

UNDERGRADUATE INSTRUCTION IN PEDAGOGY

By THOMAS M. BALLIET, Ph. D., Dean of the School of Pedagogy,
New York University

Should undergraduate instruction in pedagogy in our colleges differ from graduate instruction in our universities? If so, in what respects? Should it have the same aim and be only of a more elementary character? Should it aim to lay the foundation for future graduate study? Or should it aim to prepare the student to go out after graduation from college and teach school?

These are questions, it seems to me, which have not received the attention which the present situation in our colleges demands.

In the case of students of law and of medicine, and to some extent also those of engineering, certain studies pursued in their undergraduate course and bearing directly on their profession are credited both towards their Bachelor's degree and later towards their professional degree. In some universities the first part of the professional course is allowed to be substituted for the last part of the undergraduate course and is credited towards both degrees. It is clear that in these cases, undergraduate studies of a professional character should be such as are fundamental to later professional study, and that the aim of the instruction should be to prepare the student for such study. The student of law does not begin the practice of the law, and the student of medicine the practice of medicine, immediately upon graduation from college; but he begins at once his professional studies and does not enter upon the practice of his profession until his entire professional course is completed.

The case of the student of pedagogy, however, is different. Immediately upon graduation from college he enters upon his work as a teacher; only in rare cases does he go from the college to the university and pursue a course in education there before beginning to teach. This fact has a vital bearing on the question as to what the character of his undergraduate course in pedagogy should be. The time will, no doubt, come when a college graduate who is to be a teacher will be required to devote several years to professional study in a university before entering upon his profession, but that time is apparently in the distant future; and until then provision must be made in our colleges to give that "first aid" which will enable the fresh

graduate to teach and manage a school with at least moderate success until he can learn by experience what he ought to have learned in a professional school before he began to teach.

Professorships of pedagogy in colleges, I believe, are temporary means to help out a desperate situation. Under present conditions they seem to be the only means by which many teachers for our secondary schools can get any professional training whatever. Ultimately we shall recognize the fact that as law schools are necessary to train lawyers, medical schools to train physicians, so there is need of professional schools in our universities on a graduate basis, for the training of teachers for secondary schools and the supervisory positions in the elementary schools.

But to meet the immediate needs much can be done in an undergraduate course, and much is now being done in some colleges, even by a single professor, that will be of great practical value to the young graduate who cannot afford to go through a professional school. Obviously in such a course no attempt should be made to cover the entire field as would be done in a university school.

The question, then, as to what part of the field should be covered, where the emphasis should be placed, and in what respects such a course should differ from a graduate course becomes a vital one. It seems to me that we are not now making a sufficient distinction between the two. Undergraduate courses in many colleges seem to differ from graduate courses in quantity rather than in aim and character; and much of the instruction, while it may have a high academic or culture value, does not directly train the student to do the work of the school. As most college graduates who enter upon the profession of teaching do so immediately upon graduation from college, the aim of the pedagogical training in college should be very practical. Such training should be of a character to give them all the help possible to teach and to manage a school. Not to speak of the interests of their pupils, which are paramount, their own reappointment and their future career depend largely upon the quality of their first year's work. Unless the undergraduate instruction in pedagogy enables young graduates to teach and manage a school better than they could have taught and managed it without it, school authorities will not make much account of such training in the selection of their teachers. When you cannot detect a trace of such instruction in the schoolroom work of young graduates—as I have personally known it to be the case in not a few instances—school authorities will not take the training very seriously.

An undergraduate course in pedagogy should have a twofold aim. First, it ought to bring before the student the leading

problems of education and impress on him their bigness and their difficulty. The young graduate is apt to appreciate only the academic side of the teacher's equipment, and to imagine, as some older persons in college faculties still do, that teaching is mainly a knack and does not involve any very profound or perplexing problems. It is possible to introduce a student to the study of pedagogy by a clear presentation of the problems of pedagogy just as it is possible to introduce him to the study of philosophy by a preliminary statement and brief discussion of the problems of philosophy. It matters little whether such a course be called "Philosophy of Education," "Principles of Education" or "Introduction to Pedagogy," only so the aim be what it should be. Certain problems of education can be best formulated in connection with the history of education, but as these are problems of social or state education and the young teacher has at first to deal mainly with those of individual education, these latter should receive the emphasis.

In the second place, such a course should aim to give him the practical training which will actually enable him to teach school. This involves instruction in methods of teaching and in methods of managing a school. It is not the larger problems of school administration which he needs to study—the organization of a school system, types of schools, the appointment of teachers, the financing of a school system, and others like them. With these even the most ambitious young graduate can hope to have but little to do for some years to come. It is rather the problems of class discipline, class management, methods of promotion, and the management of the apparently petty details which so largely determine the successful running of a school, which he needs to understand. If there is time for a brief discussion of the larger questions so much the better, but they must not crowd out the others.

The instruction in method should cover the subjects which he is likely to teach. I have found that many young graduates are almost protoplasmic in their lack of differentiation and are willing to undertake to teach almost any subject in the curriculum of the secondary school. This condition of mind suggests that an undergraduate should be made familiar with the principles underlying method as determined by subject matter and the laws of mind, and with the best methods of presenting quite a large group of related studies in the curriculum of secondary schools. These methods should be discussed in detail, even to the suggesting of happy devices. Anything short of this will not answer his needs. To assume that if a young teacher is taught the principles of method he can and ought to make his own applications, is to take an untenable position. Often, after a teacher understands the principle involved, the

suggesting of happy devices is the most helpful thing that can be done for him. We do not train surgeons by teaching them merely the "principles" of surgery and then letting them apply them themselves, but we teach them the details of operations. Even after such training they will sometimes travel a thousand miles to witness an operation performed by a great surgeon. The best training for the lawyer and the engineer cannot afford to leave out the practical side. The training of teachers is no exception. It must not be predominantly theoretical in an undergraduate course, where there is in the main time only for the practical.

It is a weakness of the small village high school that there are too few teachers to make much specialization possible. A teacher is obliged to teach too many subjects to teach any of them well. On the other hand, it is a weakness of the larger city high school that there is too much specialization. It makes the teacher narrow in his outlook, he fails to see the close interrelations of subjects, he is more interested in his "specialty" than in his pupils, and usually has little interest in the broader educational problems of secondary education. A high degree of specialization is absolutely necessary in a university where research must constitute a large part of the work; but in a secondary school, where at best only the elements of any subject can be mastered by pupils, such specialization is fatal to good teaching and to the growth of the teacher. Because of the elementary character of the work, the teacher in a secondary school must find his chief interest in his pupils, who present to him ever new and fresh problems, and not in his subject. Every such teacher should, therefore, be prepared to teach an entire group of related subjects. Every teacher of Greek should also be able to teach not only Greek history, but also Latin and Roman history, every teacher of any of the natural sciences should be able to teach any other or all of the natural sciences in the course.

At all events, he should be able to teach either physics and chemistry or any other two of the sciences, and not confine himself to one science. Every teacher of mathematics should be able to teach every branch of mathematics taught in the school and physics besides.

Accordingly every student should be well trained in the method of teaching at least one group of related secondary school studies.

I am aware that there is a prejudice in many college faculties against pedagogy as such and particularly against instruction in method. Such instruction is characterized as not "cultural," not "scholarly," and is thought to be out of keeping with the dignity of collegiate instruction. This is a prejudice

which has been partly justified by the superficial literature on pedagogy, especially that on method, which we have produced in this country, but which is being rapidly displaced by a literature of a more scholarly kind. It is a prejudice which must be patiently dealt with and which will in due time surely die out.

It seems to me one of the most pressing problems in pedagogy to-day is that of method. We have had so much superficial literature on it that it is difficult to interest the theoretical student in it. It is the subject in which teachers of pedagogy in colleges and universities are weakest to-day. Of what practical value is all our study of educational psychology, of the history of education, of the philosophy of education, our child study, our experimental pedagogy, if it does not finally result in the devising of better methods of teaching and make the teacher more skillful and effective in his work?

The question as to who shall give this instruction in method is one to which various answers are possible. It is obvious that no one person can give it. The professor of pedagogy may be familiar with the details of method in several groups of secondary school studies, but he cannot compass the entire curriculum. In a few colleges it has been found feasible to have this instruction given by other members of the faculty, each professor teaching the method of his own specialty. In many colleges—perhaps in most of them—this is not practicable to-day, because most of the professors know little of secondary school problems and conditions and of the modifications of college methods which these make necessary. As a rule, college methods of teaching, even if they are good for college instruction—which they not always are—are very generally bad when employed in the secondary school. Probably the most satisfactory solution of the problem under present conditions is to have part of the instruction in method given by the professor of pedagogy and the rest by successful teachers in neighboring high schools.

By way of supplementing this training in method, provision should be made, as is now quite generally done, for the visiting of nearby schools in which the student can witness the working out of what he is theoretically taught. Where possible this should be followed by a limited amount of practice teaching. All this is now generally recognized. But what is not yet recognized is that, without specific instruction in method to interpret to the student what he sees, the visiting of schools is of little consequence; and that, without previous instruction in method and without careful direction and critical supervision, practice teaching is of little value.

To what extent should the history of education be taught to

undergraduates? The history of education is a part of the history of civilization and is a subject which ought to occupy a large place in a graduate school of education; but it is not a branch of pedagogy which directly helps the young teacher to do skillful teaching or to govern his school, and should therefore occupy quite a subordinate place in an undergraduate course. Furthermore, it is a subject the thorough treatment of which requires a degree of preparation which few undergraduates, if any, have. It involves a knowledge of the history of philosophy, of social and industrial as well as political history, of church history, and of the history of art and of literature. Without such preparation much of the subject remains unintelligible to the student. It is a branch of pedagogy which should in the main be reserved for graduate work.

All that should be attempted in this subject in an undergraduate course, should be: First, to show the student how society in all ages has used the school to solve certain of its problems and to perpetuate civilization and culture; and to impress on him the function of the school in the social heredity of the race. Secondly, to trace the origin and growth of the ideals of education which are dominant in the educational thought of to-day. For the former purpose, a comparatively few well-planned lectures will answer; for the latter the material indicated by a book like Quick's *Educational Reformers* will be ample. It has been said that such a course in the history of education would seem superficial to the student and would not command his respect. I think it can be said, without unfairness, that where this is the result, it is not the fault of the course.

The question of the psychology that should be required—both in quantity and kind—is often not easy to solve. Unfortunately the psychology taught in our colleges to undergraduates is very largely experimental psychology and is not the sort of psychology which appeals to them; nor is it the psychology which is of much value to the prospective teacher. All professors of pedagogy recognize this fact, and they usually lug into the course, somewhat surreptitiously, as much of the psychology which is helpful to the teacher as they can, under what they denominate "Principles of Education" or "Philosophy of Education." So long as it is not called "Psychology" the department or professor of psychology does not object. Such subjects as memory, imagination, types of mental reproduction, habit, instinct, the feelings, characteristics of adolescence, fatigue, are subjects which ought to be discussed with undergraduates, but with special emphasis on their application to teaching and to life. A number of simple experimental studies in experimental pedagogy can profitably be made for

which no intricate apparatus is necessary, if only to check the tendency to form hasty conclusions.

Much of this instruction can be effectively given in connection with the instruction in methods as the immediate reason for the method. Much of the instruction in principles of education can be given in the same way. To summarize briefly, I would say that we ought to discriminate more than we do between the aim and character of undergraduate and of graduate instruction in pedagogy. The aim of the undergraduate instruction should be much more practical than it now is. It ought to treat every subject with direct reference to its practical bearing, and aim to do all it can to make the student as efficient a teacher as possible the very day he enters the schoolroom. College training in pedagogy will not permanently retain the respect of school superintendents and principals unless this is accomplished. Up to the present, the value of such training has been largely accepted on faith.

On the contrary, in the graduate school of pedagogy of the university, organized like any other of its professional schools, with a Faculty each of whom can devote himself to one department of pedagogy, and with a student body that is mature and most of whom have had some experience in teaching, the aim should be different. Here the history of education should occupy a large place; the philosophy of education should deal in a scholarly way with the great educational problems and with the conditions and methods of their solution; experimental psychology should have its place, and experimental pedagogy should be assigned a large place—much larger than it now has; the great problems of administering our city and state school systems should be discussed, and the details of schoolroom work may now well be assigned a subordinate place or omitted; the instruction in method should dwell not on devices but on the psychological basis of method and on the necessary modifications of current methods, familiar to the student, in the light of the results of psychology and of experimental pedagogy.

Along with all these courses, more strictly pedagogical, the student should be required to take at least ethics, sociology and the history of philosophy.

Finally, a school of education of this kind should make ample provision for research. The teaching profession has a right to look to these university schools of pedagogy for new light on educational questions. Teachers in elementary and secondary schools are too much burdened with their daily work and have not the necessary facilities to carry on investigations as the professors of pedagogy in universities have. They can rightfully demand of the university that it aid them in solving their perplexing problems.

THE DEPARTMENT OF EDUCATION IN COLLEGES FOR WOMEN

By ANNA J. McKEAG, Ph. D., Wellesley College

A department of education should, to a certain extent, be adapted to its academic environment. In the colleges for women the conditions are different from those found in the state universities and the teachers' colleges; distinctly cultural aims receive greater emphasis. Moreover, only about one-third to one-half of our students expect to enter upon definite salaried occupations or professions.

Because of these and other conditions, it would be inexpedient, even if it were desirable, for those of us who teach education in colleges for women to attempt a differentiation of undergraduate introductory courses on the basis of the vocational or non-vocational aims of our students. I believe that such a differentiation (in the first year's work in the department) would be undesirable, even if it were expedient. The prospective teacher, the prospective home-maker, the prospective social worker, may profit equally from the same first course in education, just as the future journalist, physician, and engineer, from the same freshman course in English. Differentiation properly comes later, in advanced courses.

That the two courses most commonly given as the first courses in the department of education (History of Education and Principles of Education) should be given in the same manner and in the same classes to professional and non-professional students (in colleges for women), is a point that needs to be emphasized. Much of the discredit that has attached to our departments of pedagogy has been due to the fact that we have addressed ourselves too exclusively to teachers. Education is a public institution and as such is worthy of study by all college students. Let us catch in the net of our introductory courses as many non-professional students as possible, for of such is the future school committee.

A good deal of diversity of opinion still exists among us as to the aims of the first two courses in education. I believe that, in the first place, the informational aspect of the subject should receive due emphasis. Information-courses are, it is true, at a discount in collegiate circles just now, but surely a reasonable amount of extensive work is necessary in order

that the student may get any kind of orientation for his future intensive courses. A clear, orderly, and systematic presentation of the great educational systems and theories is desirable for first-year students in the department of education.

Closely allied to this informational aim of our introductory courses is a second and equally fundamental one. Courses in education should exemplify a good method. Such method will vary with the course, it will vary with the equipment of the instructor, it will vary with the previous academic history of the class, but it is important that we should give in our departments really good teaching. I should not wish to be understood as undervaluing the subsequent presentation of the subject of general method or of special methods in a separate course; I am speaking now merely of the first year's work in the department.

A third of these more general aims of introductory courses may be characterized as inspirational. One of the great utilities of the study of the History of Education is that, through this subject, prospective teachers gain a feeling of professional pride, an *esprit de corps*, akin to that which is recognized as a powerful stimulus to good work in other professions. In these days of research work and critical scholarship, we college teachers are prone to relegate enthusiasms and ideals to the lumberheaps of our academic attics, forgetting the very great importance, to most young people, of just such subjective factors.

To what extent should the first year's course in education be professional, in the sense in which the term professional is commonly used? As institutions of higher learning, colleges very properly demand that courses in the department of education shall not be inferior to courses in other departments, judged from the standpoint of scholarship. The superintendents and principals of schools rightly ask that our students shall "make good" in the schoolroom. Both of these demands are reasonable. There should be, and I believe there is, no antagonism between knowledge and efficiency. The introductory course in the History of Education, for instance, may have both cultural and practical value, if presented from such a standpoint as that which was described by Dr. Suzallo in a recent paper: "A selective, interpretative, and fully unified treatment of educational experience in its various aspects and relations, used as an aid in the formulation of a theory for the control of the present practice which is to be viewed as the latest stage in our educational evolution."¹

Introductory courses in the principles and the history of

¹ Proc. Soc. College Teachers of Educ., 1908, p. 54.

education should, it goes without saying, have constant reference to actual schoolroom conditions. The study of children and observation of schoolroom methods and practices should form an important part of the student's work. So far as my knowledge extends, departments of education in colleges for women have been most cordially given by superintendents and principals ample facilities for studying school work under natural conditions.

Among the problems most difficult of solution in college departments of education is that of the place which should be assigned to practice teaching. It may be seriously questioned whether students get any permanent good from what may be called "sporadic" practice teaching; and the exigencies of undergraduate schedules seem to preclude the possibility of anything else. The ideal solution of the problem seems to consist in the addition of a year of graduate professional work, of which the regular systematic teaching of a class for a semester shall constitute a part.

Most of our professional students desire to go into secondary school teaching on leaving college. While it is desirable that the fundamental importance of elementary school work should be brought to their attention, and while it is to be hoped that eventually many of our best graduates will be drawn into the elementary schools, it must be remembered that the body of college graduates is still a comparatively small one, that secondary schools need pedagogically trained teachers, and that the field of elementary education is already largely occupied by the normal schools. Hence, largely as a matter of expediency, and without any thought of assigning any superior importance to one set of schools over the other, it may be better that colleges for women should make a special effort to send out properly equipped teachers for secondary schools,—for a few years, at least.

I should like to outline a course in secondary education, which might profitably occupy the greater part of a year of graduate professional work in colleges for women.¹

1. A study of the development of secondary education, with special reference to the development of the American High School.
2. A study of the fundamental principles underlying the education of adolescents. Physiological and psychological considerations should receive due emphasis, and there should be a careful study of the hygiene of instruction.
3. A study of the organization and curriculum of two typical high schools; one a city high school, the other a village school.

¹ This course is being given at Wellesley College (1909-10).

4. Each member of the class should make a study of the special methods of teaching one high school subject or group of subjects. This will include: (1). A study of recent educational reports and the best books relating to the teaching of this subject or group of subjects. (2). Observation of the work of skilled high school teachers of the subject. (3). Instruction in good methods of arranging and ordering the material in the subject. This part of the course should be given by an instructor qualified both by scholarship and by secondary school experience to give such instruction.

5. Practice teaching. Each member of the class should be required to teach a class for a semester in her chosen subject. This should be done under the joint supervision of the department of education and the principal of the high school.

These seem to me to be among the legitimate aims of departments of education. It goes without saying that we should make it perfectly clear to our students that we hold out absolutely no hope to the mediocre, the indolent, the careless, or to those of unsuitable personality, that by our courses they may, in some alchemic manner, be changed into good teachers. There are other limitations that we must admit: we are, as it were, but middlemen between the producer and the consumer; between the pure psychologist and biologist on the one hand, and the schools on the other. Yet our field is none the less useful and none the less definite.

To summarize:

The work of at least the first year in departments of education should be given to professional and non-professional students in the same classes.

Work in observation of children and of schools should form a part of the introductory courses in education.

Informational, cultural, and inspirational aims should not be neglected.

More narrowly technical courses can be given to best advantage to graduate students. College graduates should be encouraged to give a year to systematic and professional preparation for high school teaching.

Our departments should include a sufficiently large teaching staff to make possible to instructors a personal knowledge of the capacities and aims of their students.

EDUCATION AS A COLLEGE SUBJECT

By EDWARD FRANKLIN BUCHNER, PH. D., Johns Hopkins University

Two things stand out in a very interesting way when one comes to view the situation surrounding education as a college subject. To such as "believe in" education, the recent widespread introduction of the subject into the curriculum of the colleges and the universities is most gratifying. The records of this movement, which have been made, for example, in the reports of the Commissioner of Education of the United States, by Bolton, Farrand, Kinnaman, Luckey, and others, show that the subject has acquired a most hopeful, and in many respects remarkable, intellectual interest. The range of historic and present day facts and the seriousness of the scientific foundations of theory alike show the inordinate gains which have been made so rapidly. On the other hand, the resistance in higher educational circles against "pedagogy" has not entirely ceased. The older conception, which interpreted the teacher exhaustively in terms of scholarship, lingers in many places outside as well as inside academic walls. It cannot be denied that this resistance has been and is good for both the scientific and the academic integrity of our subject. It must, as it should, win its way into a confidence that demands, and is entitled to full justification.

It is particularly encouraging to note the striking advances which education as a specific topic has made. Restricting the view to a few American events, one becomes impressed with the unusual broadening which has come to it in a few decades. Seventy years ago (1839) our first normal school had its beginnings here in Massachusetts. *Forty* years later (1879) we find in Michigan the first university chair of education, marked by reason of its helpful continuity with more recent developments. Nearly *twenty* years more pass (1898), and we discover in Teachers' College a university school or department of education in its affiliations with Columbia University. A full *decade* more brings us well within the thought of these days of celebration when we signalize the twenty years of achievement at this institution. Whether the same rate of gain shall continue to hold in the future is a fair hope that must be left, not to the prophet of to-day, but to the historian of *five* years hence. No one of these movements has supplanted any

of the others; instead, each has been a special stimulus to those which followed. The rapid acceleration of speed in the widening sphere of content and method in education has been nowhere more emphatically recorded than in the contributions and aspirations which have flowed forth from these walls during the two decades over whose termination we make festival at this time. There is ample reason for sincere congratulation upon the newer character that has become the possession of education in these days. The closer definition of problems has opened the way for more careful and exact scrutiny of methods of inquiry until we have long since passed the hour when our subject has become the happy recipient of the best that is to be gained from the application of the technique of almost every mode of human investigation.

The rapid series of events which have won for our subject an increasingly favorable recognition in academic centres may also be regarded as significant in another direction. The peculiar emphasis placed upon education to-day cannot be viewed other than as one of the quickening processes by which democracy becomes conscious of itself. The American public has, from the early days, believed in the striking necessity of education as the most distinct social force. And, the practice of teaching and the experience in administering schools of almost all orders have proceeded with the conviction that this force is amenable to an increasingly direct and scientific control. It is true that education as an art, and not America, was "discovered" first; but it is also becoming more and more true that the inner logic of our typical social and political institutions is working its expression out into the insistent demands of our national life that clamor at the doors of our higher institutions of learning for satisfaction. For this reason, if for none other, the normal school could not remain typical of our profounder belief in the democratic efficacy of education as a practice. Our educational problem in its theoretical aspects has just as definitely outgrown the distinctive excellencies of the normal school as the latter has found itself incapable of modifying itself to meet the needs of the changing complexion of our more richly varied modern life. The normal school, therefore, properly continues to exercise its special and important function of training teachers for our elementary schools, while the institutions of higher education have found it more and more clearly to be their own duty to enrich the content of education by investigation and to disseminate this knowledge and its methods by training teachers for our higher and more special schools. It is such a train of inner events which accounts for the excellent external fortunes of education as a college and university subject.

It is not my wish at this time to reiterate the many words

that have been said during these recent decades in favor of education, nor to sketch the arguments which have been devised for the support of the growing belief in its academic integrity. Those who are interested in this celebration, whether absent or here assembled, are now pretty well agreed upon the intrinsic merits of education as well from the cultural as the professional point of view. It may, therefore, be more serviceable should I venture to suggest some less patent, but none the less weighty, considerations which tend to determine the good and ill fortunes of education as a college subject.

Speaking in the full light of the historical and scientific interpretations now in our possession, it must be said most emphatically that education as a college subject depends chiefly upon the particular college itself. And by the college, we must understand its traditions, its location and the relative density of population in which it is centered, its financial resources, its modes of appeal for students, its purposes so far as these are socialized and democratized, and finally the institutional interest it may have in the specific future welfare of its students. These items come close to an exhaustive description of any given college. No one of us need review at length institutions of his acquaintance without finding such as readily illustrate these dependencies. A college far removed from centres of population is not inclined to sense the duty of recognizing education as a future life interest of some or all of its students. On the other hand, the college situated in the midst of a populous area, or even a state university irrespective of its location but sensitive to the public's requirement of trained citizens—not to say teachers, is more than likely to be alive to the civic service that is immediately possible of realization through a well-balanced establishment of education as a subject of teaching and study. Again, a college loaded with more or less unwieldy traditions, and at the same time light in financial resources, is not apt to hasten the introduction of education. Its conservatism pledges it to a maintenance of the longer standardized subjects. On the other hand, it is not an unknown practice on the part of young institutions, 'unhampered' by traditions, students, or funds, to resort to the establishment of a "normal department" in the hope of securing students for the institution as a whole. It is, however, chiefly when a higher institution awakens to the necessity as well as the possibility of performing a distinct social service that the welfare of education is most likely to be promoted. There remains to-day scarcely a college or a university that is not increasingly recognizing its public and social obligations, and is not endeavoring to modify its ideals and equipment accordingly. The old days of collegiate isolation and academic in-

difference are practically gone. Into this newer situation education is working its way more and more acceptably. But, into a detailed elaboration of the bearings of these factors, either with reference to the attitude of the college towards education as a proposed subject, or with reference to the fortunes of education after it has become an accredited interest in the college, the limitations of this conference hour do not permit us to go.

The other group of contingencies of which I wish to remind you may be stated very summarily. When education as a subject finally gets into the college, what it becomes,—or, what becomes of it,—depends upon the man who put, or who keeps, it there. And this is almost identical with saying that it depends upon what education is, or is thought to be. If the traditions of former generations and the experiences of past attempts at schooling are conceived to be the best avenues for securing training for to-day, then the history and the classical literature of education become over-emphasized. If the generalizations of individual development and training are the chief goal, then the theory or principles of education determine the prevailing interests.

If the manipulations of the agencies most effective in handling masses of children in the light of natural limitations and of the current demands of democracy are the goal, then education tends to be restricted to school administration. And so on to the end of the chief topics that constitute education as a subject of teaching and study. But, happily, we have well passed through the stages when history, theory, methods, hygiene, and economy were each given a radical emphasis, and the collegiate standing of our subject has become an encouragement for each of these formative educational problems. Furthermore, there is definite progress made in our approaching standard evaluation of these factors, irrespective of the future prospects of the college student who is to become a citizen trained in thinking over the problems inherent in the community interest in a system of schools, or who may become a teacher trained in the demands of a more and more intelligent and responsible citizenship.

It is not too much to say, finally, that the college should consider the intrinsic merits of education, both as a 'subject' and as a part of life,—its real value in relation to academic culture, before reaching the decision whether the study of it should be included in its own curriculum. While the study of education should, on the one hand, tend to "professionalize" the future teacher, it does, on the other, definitely "liberalize" the college student. Here, indeed, must be sought the last claim favorable to education as a college subject.

THE HEALTH OF TEACHERS

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I ask your attention, for a few minutes, to the consideration of the health of teachers as illustrating the general thesis of this conference, "The Need of Investigation in the Field of School Hygiene;" and, more especially, the motives, by appeal to which, investigation may be made effective, both in itself and in practical results.

From a practical standpoint needs are purely relative. From a scientific standpoint, investigations in the field of school hygiene are needed to fill gaps in knowledge. It is enough that here is ignorance. Curiosity is sufficient motive. The desire for knowledge constitutes the need. To the lay mind, however, this is foolishness—and in large measure the community mind is *lay* with respect to the hygienic aspects of education. It is an exceedingly vital matter, therefore, to find needs which appeal to the lay mind, motives for investigation and application of hygienic principles that will seem worth while to those whose interests are practical rather than theoretical.

From this standpoint, therefore, I wish to present some brief observations upon motives for the investigation of the health of teachers. Scientific curiosity at once says: "We ought to know about this matter; we ought to know whether the health of teachers compares favorably with that of the members of other professions; we ought to know what diseases teachers are specially liable to; what conditions in school life are especially unfavorable; what sex differences there are; what differences there are between teachers of different grades (elementary, secondary, higher)." Practical interest asks, however: "To what end? What will be done, who will be benefited, if such questions as these are answered?" It must be shown that the answers to such questions have immediate and practical significance if we would win the co-operation of the practical minded. For my present purpose, practical motives may be generalized into three classes: self-protective, humanitarian, and economic.

Teachers should be motivated by self-protective interests. Teachers, after all, are human beings with about the same constitutions as other human beings. Doubtless it is true that altruistic motives, closely allied to the parental instinct, are

powerfully operative in the real teacher. The aim and rewards of teaching are the welfare of others. To spend and be spent is the normal business of teaching. But joyous expenditure of energy in service is possible only to him who hath energy. If every teacher were thus actuated by ideal motives, were serving in the "noblest of professions" purely in the interest of humanity, and not at all as the most convenient means of a livelihood, health as a means to that end would still be a solemn duty—the duty of being as efficient as possible in the chosen service.

That their own welfare and happiness are at stake is sufficient reason why teachers should have an active interest in the investigation of the hygiene of their own occupation. It doubtless ought to be sufficient reason why others, especially parents, should be similarly interested; and *doubtless it is not*. Something more personal and intimate is required to stir the interest in any community except of the slender few who are humanitarians by nature. Sweat-shop evils draw but a languid protest from most people until they appreciate that sweat-shops are a menace to the community health, and, therefore, to themselves, as individuals or as families. Sometimes, even, the concrete demonstration of an epidemic is required.

To win the general attention from parents to the importance of protecting the health of teachers—which of course is the end of investigation—it must be shown that teachers of subnormal health are a menace to children; or, at least, that the value of the school to the children varies directly with the health and vitality of the teacher. This will hardly be questioned by competent school and medical men; but about the best that can be done at present, in presenting the matter to the public, is merely authoritative general statement. We know in a general way, by common experience, that teachers are liable to nervous disorders and that this common experience is confirmed by such few careful investigations as have been made. As to the real extent and degree of this factor we are in the dark. Mr. W. H. Allen declares that it has come to be "a matter of course that teachers are nervous wrecks" and "this fact is offered by teachers themselves as sufficient explanation for impatience, irritability, and downright ugliness of disposition." If Mr. Allen's assertion be even half true the moral damage to children from this source is incalculable. Not to mention nervous injury and intellectual loss, the moral damage furnishes the strongest kind of motive for investigation of the health of teachers, a motive that will be effective in enlisting the interest of all intelligent parents. The fact that a certain percentage of all the teachers in the community are suffering from nervous strain, so that their personal happiness and joy in life are im-

paired, may elicit commiseration and some deprecatory protestations that something ought to be done; but the fact that this does not stop with the sufferers, but is transformed into positive damage to the children in our several homes is quite another matter. We as parents want to know whether the teachers of *our* children are thus suffering and we are even interested in knowing both the extent and the nature of the ills to which the conditions of school life render the teachers especially liable.

Finally there is the economic, the tax-payer motive. As humanitarians or as parents, we of the community may be appealed to on account of the injury teachers, as a class, suffer from the unhygienic conditions of school life or the injury that our children receive through the agency of teachers who have thus suffered; but there is still the tax-payer part of us, individually and collectively, that is not moved by these considerations. We must be shown the wastefulness of ill-health in the teacher. The American Health League is presenting some very impressive figures as to the economic waste of ill-health. The loss from premature death, reduction of labor on account of preventable sickness, the cost of sickness in the form of the expense of doctors and nurses, and reduced efficiency due to impaired vitality—these losses amount annually to a total of billions of dollars. We have here a powerful motive for investigation and improving conditions of life. It becomes a matter of real consequence to the tax-payer whether the hygienic conditions of teaching are such as to guarantee the best services of which the teacher is capable.

